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URBAN TRAFFIC CONTROL AND BUS PRIORITY SYSTEM SOFTWARE MANUAL

Vol. II. Variable Definitions; Algorithm and Off-line Software Descriptions

June 1976
Final Report Revision C

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Prepared for
FEDERAL HIGHWAY ADMINISTRATION
Offices of Research & Development
Washington, D. C. 20590

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An Urban Traffic Control and Bus Priority System has been implemented by the Sperry Systems Management Division in the District of Columbia under Federal Highway Administration contract No. FH-11-7605, Advanced Control Technology in Urban Traffic Control Systems - Installation. The system includes on-street surveillance and control elements and a central office data processing facility. This manual describes the software for this system. This is Volume II of 2 volumes which comprise the UTCS/BPS Software Manual. It contains Section 3, Glossary and Section 4, Appendices.

The other report of this pair is:

Report FHWA-RD-76-185 Vol. 1
UTCS/BPS Software Manual - Functional Description and Flow Charts.
Addenda to these manuals are:

Report FHWA-RD-76-182.
Addenda to UTCS/BPS Software Manual for UTCS/CIC, UTCS/MGVD and UTCS/PBPS

Report FHWA-RD-73-9	UTCS/BPS Design and Installation
Report FHWA-RD-76-183	UTCS/BPS Operator's Manual
Report FHWA-RD-76-184	UTCS/BPS Maintenance Manual
Report FHWA-RD-76-160	UTCS/BPS Operation and Maintenance Manual.

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FOR

URBAN TRAFFIC CONTROL

AND

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SOFTWARE MANUAL

(Pub. No. GF-16-1003)

VOLUME 2

Revision A, dated March 1973, replaces the following pages in their entirety:

ii through viii
3.0.1 through 3.0.44
4.1.1 through 4.1.2
4.2.1/4.3.1
4.4.1/4.5.1
4.5.2 through 4.5.78
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4.7.11
4.7.14
4.7.16 through 4.7.17
4.8.2 through 4.8.3
4.9.1 through 4.9.6
4.10.1 through 4.10.2

Revision B, dated April 1974, replaces the following pages in their entirety:

3.0.5
3.0.10
3.0.14
3.0.23
3.0.25
3.0.32
3.0.35 through 3.0.38
3.0.40 through 3.0.42
4.5.6 through 4.5.70
4.7.2
4.7.17
4.9.1 through 4.9.2
4.9.4
4.9.5/4.9.6

Revision C, dated May 1976, replaces the following page in its entirety:

4.7.2

FOREWORD

An Urban Traffic Control and Bus Priority System has been implemented by the Sperry Systems Management Division in the District of Columbia under Federal Highway Administration contract No. FH-11-7605, Advanced Control Technology in Urban Traffic Control Systems - Installation. The system includes on-street surveillance and control elements and a central office data processing facility. This manual describes the software for this system. The manual is composed of the following volumes:

Volume I	Section 1	Introduction
	Section 2	Programming Specifications
Volume II	Section 3	Glossary
	Section 4	Appendices
Volume III	Section 5	Assembly Listings

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3. Glossary

This section contains a glossary that is useful for understanding the functional aspects of the flow charts and for making future programming modifications. The glossary contains global assembly symbols and internal symbols. Global assembly symbols are mnemonics that are defined in one assembled routine and usually referenced in at least one other assembled routine. It should be noted that all BPS routines were assembled for convenience purposes as one routine and given the symbol BPS. This was done since the BPS routines that are processed in the BPS CPU are not relocatable, and must therefore be assembled with an absolute starting location. Also, all global assembly symbols used in the BPS routines must be defined in a UTCS routine that is processed in the UTCS CPU. Internal symbols are used solely within one assembled UTCS routine or within the assembled BPS routines (symbol BPS). The BPS internal symbols are therefore composed of mnemonics used within one BPS routine (that is, Routines BA, BB, BC, BD, BE or BF) or mnemonics used in more than one BPS routine, but not in any UTCS routine.

For each alphabetically listed symbol, the glossary shown in Figure 3.0.1 contains its description, array index (or NA if not applicable), reference routines (for global symbols, an asterisk indicates the routine in which the symbol is defined), units (or ND if non-dimensional), scale (Bx indicates the binary point is x bits from the least significant end), format (BIT* indicates that the bit array is word interleaved) and the storage. Symbols representing unique internals that are temporarily stored in one of the 16 general storage registers have zero listed in the storage column. Symbols representing non-unique internal variables or indices are not listed in the glossary since their useage varies.

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
A	TEMPORARY STORAGE USED AS DETECTOR PRESENCE INDICATOR	NA	B	ND	NA	BIT	0
ABFLAG	INDICATOR SET TO 0 IF THRU BUS DETECTED, TO 1 IF STOP BUS DETECTED.	NA	BC	ND	B0	WORD	1
ACK	ACKNOWLEDGE COLUMN OF FAILURE STATUS REPORT	NA	H	ND	B0	WORD	0
ADVINH	ADVANCE PULSE INHIBIT FLAG	CONTR	*Y,P,T	ND	B0	BIT *	4
AGR	A-PHASE GREEN RETURN	CONTR	*A	ND	B0	BIT *	16
AHCC	SMOOTHED OCCUPANCY	LINK	*Y,F,J,K, W	ND	B15	HALF	136
AHHIST	OCCUPANCY HISTORY FOR THE PATTERN READ IN RTN W	LINK	*Y,F,J,K, W	ND	B15	HALF	136
AMOEPN	ADJUSTABLE MOE PERIOD NO. INDEX = 6*CONTR + (ADJUSTABLE MOE PERIODS COUNTER)	INDEX	*Y,G,U	ND	B0	BYTE	348
AOG	CORRECTED A-PHASE GREEN RETURN ARRAY. EACH BIT REPRESENTS THE STATUS OF A PARTICULAR A-PHASE GREEN RETURN SIGNAL. A BIT-VALUE OF 1 = PRESENCE.	CONTR	*O,A1,P,X	ND	B0	BIT *	8
APO	ADVANCE PULSE OUTPUT COMND. EACH BIT REPRESENTS THE STATUS OF A PARTICULAR CONTROLLER ADVANCE SIGNAL. A BIT-VALUE OF 1 = PRESENCE.	CONTR	*A,A1,Y	ND	B0	BIT *	8
APOM1	ADVANCE PULSE OUTPUT DATA	CONTR	*A,BPS	ND	B0	BIT *	0
AUTOF	AUTOMATIC CONTROL DESIRED FLAG	CONTR	*Y,M,T,W, X	ND	B0	BIT *	4
AVG	TEMPORARY STORAGE USED IN STOP TIMES' CALCULATIONS	NA	C	NA	NA	WORD	0
AVSP	AVERAGE SPEED TEMPORARY STORAGE	NA	*Y,H,I	MPH	B5	WORD	1

FIGURE 3.0.1 UTCS/BPS GLOSSARY

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
BARR	BUS DETECTOR ARRAY. CONSISTING OF INPUT CODE WORDS INTERLEAVED WITH DATA ARRAYS TBI, SBI, AND BEI	BUS DET	*Y,A,BPS	ND	B0	BIT *	48
BARRBYTE	NUMBER OF BYTES IN BARR.	NA	*Y,A	ND	B0	WORD	1
BB	EQUATED TO BARRBYTE						
BCODE	CODE FOR BPS SYSTEM STATUS-BY INTERSECTION: 0=B; 1=P; 2=X; 3=I; 4=NOT INSTRUMENTED	CONTR	*Y,H,K,M, BPS	ND	B0	BYTE	62
BCOMLENG	NUMBER OF BUS COMMUNICATIONS FAILURES TO BE LOGGED FROM BCOMTAB.	NA	*Y,K,BPS	ND	B0	WORD	1
BCOMTAB	UNIT NUMBER OF EACH FAILED BUS COMMUNICATIONS UNIT.	SEE DESCR	*Y,K,BPS	ND	B0	HALF	72
BDETLENG	NUMBER OF BUS DETECTOR FAILURES TO LOG FROM BDETTAB	NA	*Y,K,BPS	ND	B0	WORD	1
BDETTAB	UNIT NUMBER OF EACH FAILED BUS DETECTOR.	SEE DESCR	*Y,K,BPS	ND	B0	HALF	72
BDW	NO. OF BUS DETECTOR WORDS	NA	BB	ND	B0	WORD	0
BEI	BUS ERROR ARRAY. EACH BIT REPRESENTS THE STATUS OF A PARTICULAR BUS ERROR SIGNAL. A BIT-VALUE OF 1 = PRESENCE.	BUS DET	*Y,BPS	ND	B0	BIT *	48
BEL	VALUE OF BEN ON PREVIOUS SCAN.	BUS DET	BB	ND	NA	BIT *	8
BEN	BUS DETECTOR INPUT WORDS SHOWING CARRIER PULSE PRESENCE	BUS DET	BA,BB	ND	NA	BIT *	8
BG	BUS GAIN IN A BUS EXTENSION	ZONE	BE	PASS-MIN	B0	WORD	0
BL	BUS PASSENGER LOAD INDEX = 12*(ZONE NO.) + BLINDEX	INDEX	*Y,K,BPS	ND	B0	BYTE	192
BLINDEX	BASE INDEX INTO BL AND PLT ARRAYS COMPUTED IN BPS.	NA	*Y,K,BPS	ND	B0	WORD	1

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
BMODE	BPS SYSTEM STATUS MODE: 0=BPS; 1=PRE; 2=OFF	SECT	*Y,K,M,Q	ND	B0	BYTE	3
BPSCFF	BPS COMMUNICATION FAILURE FLAG	BUS DET	*Y,H,J,M, Q,BPS	ND	B0	BIT *	5
BPSCFFL	PREVIOUS VALUE OF BPSCFF	NA	*Y,M,BPS	ND	B0	BIT *	5
BPSCNT	NUMBER OF BPS CONTROLLERS IN OPERATION.	NA	*K,H	ND	B0	WORD	1
BPSCONTR	BPS CONTROLLER TABLE	CONT- RIND	H	ND	B0	BYTE	9
BPSCTL	BPS CONTROL WORD.	NA	*Y,M	ND	B0	WORD	1
BPSDFF	BPS DETECTOR FAILURE FLAG	BUS DET	*Y,H,I,J, M,Q,BPS	ND	B0	BIT *	10
BPSDFFL	PREVIOUS VALUE OF BPSDFF	BUS DET	*Y,M,BPS	ND	B0	BIT *	10
BPSDWN	FLAG TELLS CPU 2 TO GO DOWN	NA	*L,BPS	ND	B0	WORD	1
BPSENB	FLAGS SET WHEN CONTROLLER HAS BEEN OPERATOR SELECTED FOR BPS OPERATION	CONTR	*Y,H,J,K, M,Q,BPS	ND	B0	BIT *	4
BPSIF	FLAGS SET BY UTCS TO INHIBIT BUS PRIORITIES	CONTR	*Y,D,H,J, K,M,P,R, T,V,W,BPS	ND	B0	BIT *	4
BPSIFF	BPS INTERSECTION FAILURE FLAG	CONTR	*Y,M,Q, BPS	ND	B0	BIT *	8
BPSN	15 MINUTE PERIODS THAT BPSENB IS SET	ZONE	*Y,H,I	ND	B0	BYTE	18
BPSON	FLAG SET IN RTN BA EVERY 1/32 SECOND AND RESET IN RTN J	NA	*Y,J,BPS	ND	B0	WORD	1
BPSPINT	EQUATED TO BPSSYS						
BPSPMB	BPS PANEL MAILBOX	NA	*Y,M	ND	B0	WORD	4
BPSPRF	BPS PERIOD REDUCTION FLAG	MOE PER.	BD	ND	B0	BIT	13
BPSSCT	POSSIBLE BPS SECTION WIDE FLAGS. INDEX = (CONT NO.) + 128*(SECTION NO.)	INDEX	*Y,K	ND	B0	BIT	16
BPSSTF	BPS START-UP FLAG	NA	*Y,M,BPS	ND	B0	WORD	1

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
BPSSYS	BPS SYSTEM TABLE. FLAGS SET IF CONTROLLER IS A POSSIBLE BPS INTERSECTION.	CONTR	*Y,M	ND	B0	BIT *	4
BPST	NUMBER OF INTERSECTIONS THAT ARE IN BPS MODE	NA	H	ND	B0	WORD	1
BPSYSIF	BPS SYSTEM INHIBIT FLAG SET IN RTN L WHEN BPS COMPUTER HAS FAILED. OTHERWISE, RESET.	NA	*Y,A,D,H, L	ND	B0	WORD	1
BPTRANF	BPS TRANSITION FLAG INDICATING THAT A BUS EXTENSION HAS BEEN GRANTED	CONTR	*Y,D,T,V	ND	B0	BIT *	4
BRANIND	BRANCH INDEX. POINTS TO THE STARTING ADDRESS OF RTNH.	NA	H	ND	B0	WORD	1
BSL	VALUE OF BSN ON PREVIOUS SCAN.	BUS DET	BB	ND	NA	BIT *	8
BSN	BUS DETECTOR INPUT WORDS SHOWING PRESENCE OF STOP BUSES	BUS DET	BA,BB	ND	NA	BIT *	8
BTDIFF	SUM OF UTCS ZONE COUNTS OF VEHICLES TO BE ADDED TO THE EXISTING QUEUE IF A BPS EXTENSION IS GRANTED	LINK	*Y,C,D	VEH	B2	HALF	136
BTIMEON	TIME(EBCDIC) SECTION WAS PUT INTO PRESENT BUS MODE	SECT	*Y,K,M	HRS: MIN	NA	WORD	4
BTL	VALUE OF BTN ON PREVIOUS SCAN	BUS DET	BB	ND	NA	BIT *	8
BTN	BUS DETECTOR INPUT WORDS SHOWING PRESENCE OF THRU BUSES.	BUS DET	BA,BB	ND	NA	BIT *	8
BUSCLK	CLOCKS COUNTING DOWN TO ZERO AT 1 SECOND BEFORE AMBER.	ZONE	BC,BD	SEC	B1	BYTE	64
BUSHLP	NUMBER OF BUSES HELPED DURING THE CURRENT 15 MINUTE PERIOD.	ZONE	*Y,H,J	BUSES	B0	HALF	36
BUSLKPV	ARRAY OF PERIOD VALUES FOR INITIALIZING THE BUS LINK CLOCKS	LINK	*Y,D,W, BPS	SEC	B0	BYTE	68

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
BYTCNT	NUMBER OF BYTES IN CRT BUFFER. BYTCNT(0) IS FOR CRT 2; BYTCNT(1) IS FOR CRT 1	CRT NO.	*CRTOUT,K	ND	B0	WORD	2
CC1	LINK CAR COUNT	LINK	*Y,C,D	VEH	B0	BYTE	68
CC2	DETECTOR CAR COUNT	DET	*Y,C,D,E	VEH	B0	BYTE	129
CG	CAR GAIN IN A BUS EXTENSION	ZONE	BE	PASS-MIN	B0	WORD	1
CHGTABLE	CHANGE TABLE: 5 WORDS FOR EACH ENTRY. CHGTABLE(I) = TIME CHGTABLE(I+1) = TYPE CHGTABLE(I+2) = NUMBER CHGTABLE(I+3) = CHANGE CHGTABLE(I+4) = NUMBER IF MANUAL PATTERN CHANGE, EXTENSION IF MANUAL EXTENSION WAS INSERTED, ZERO FOR ALL OTHER CHANGES.	IBL	H	ND	B0	WORD	220
CICBYP	CIC BYPASS FLAGS SET DURING TRANSITIONAL CYCLES.	CONTR	*Y,T,V	ND	B0	BIT *	4
CICCNT	COUNT FOR ACTIVE CIC'S	NA	*K,H	ND	B0	WORD	1
CICEF	CIC ENTRY FLAGS. SET WHEN ALL CONDITIONS ARE MET ENABLING CONTROLLER TO OPERATE AS A CIC.	CONTR	*Y,D,H,J, K,M,P,R, V	ND	B0	BIT *	4
CICSCT	POSSIBLE CIC SECTION WIDE FLAGS. INDEX = (CONT. NO.) + 128*(SECTION NO.)	INDEX	*Y,K,M	ND	B0	BIT	16
CICSF	CIC SELECTED FLAG. SET WHEN OPERATOR DESIGNATES CONTROLLER IS CIC.	CONTR	*Y,H,J,K, M,P,Q,R, V	ND	B0	BIT *	4
CICSYS	SYSTEM WIDE CIC FLAGS	CONTR	*Y,K,M	ND	B0	BIT *	4
CICTF	CIC THRESHOLD FLAG. SET WHEN CIC SPLIT CONTROL IS BEING IMPOSED.	CONTR	*Y,D,K,P, R,V	ND	B0	BIT *	4
CICTODF	CIC TIME OF DAY FLAGS USED TO INHIBIT CIC AS A FUNCTION OF TOD.	CONTR	*Y,K,M,V, W	ND	B0	BIT *	4
CIRCR	CONTROLLER INTERVAL NUMBERS TO BE REDUCED	MOE PER	*Y,D	ND	B0	BYTE	81

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
CMALF	CONTR. MALFUNCTION FLAGS	CONTR	*Y,H,J,K. M,P,Q,W. X	ND	B0	BIT *	4
CMMALF	DETECTOR COMMUNICATIONS MALFUNCTION FLAGS	DET	*Y,E,H,J, K,M,Q	ND	B0	BIT	17
CNTDR	COUNT DOWN REGISTERS	CONTR	*Y,D,S,T, U,V,X	SEC	B1	BYTE	31
COMKQ1	1 - KQ1	NA	*Y,D	ND	B31	WORD	1
COMKQ2	1 - KQ2	NA	*Y,D	ND	B31	WORD	1
COMKV0	1 - KV0	NA	*Y,D	ND	B31	WORD	1
COMLENG	NUMBER OF COMMUNICATION FAILURES TO BE LOGGED FROM COMTAB.	NA	*Y,E,K	ND	B0	WORD	1
COMTAB	UNIT NUMBER OF EACH FAILED COMMUNICATIONS.	SEE DESCR	*Y,E,K	ND	B0	HALF	258
CONDIS	CONTROLLER DISPLAY CODE	NA	*Y,J,M	ND	NA	WORD	1
CONLENG	NUMBER OF CONTROLLER FAIL-URES TO BE LOGGED FROM CONTAB.	NA	*Y,K,P,X	ND	B0	WORD	1
CONSEC	CONVERTS FROM CONTROLLER NUMBER TO ACTUAL SECTION NUMBER.	CONTR	*Y,K,M, KFMT	ND	B0	BYTE	31
CONTAB	UNIT NUMBER OF EACH FAILED CONTROLLER	SEE DESCR	*Y,K,P,X	ND	B0	HALF	62
CONTLN	LINK NUMBERS FOR EACH CON-TROLLER POINTED TO BY LSI MULTI-DETECTOR (CRITICAL LINKS) ARE LISTED FIRST FOR EACH CONTROLLER	LSI	*Y,D,K,V, W,BPS	ND	B0	HALF	136
CONTNM	CONTR. NO. BEING PROCESSED	NA	*Y,G,S,T, V	ND	B0	WORD	1
CONTRIND	BPS CONTROLLER TABLE INDEX	NA	H	ND	B0	WORD	1
CONTZN	ZONE NUMBERS FOR EACH CON-TROLLER POINTED TO BY ZSI	ZSI	*Y,H,I,K, M,BPS	ND	B0	BYTE	19
CPANIN	CONTROL PANEL INPUT. EACH BIT REPRESENTS THE STATUS OF A PARTICULAR CONTROL PANEL INPUT SIGNAL A BIT-VALUE OF 0 = PRESENCE.	NA	*A,M	ND	NA	WORD	10

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
CPANOU	CONTROL PANEL OUTPUT COMND	NA	*A,BPS	ND	NA	WORD	2
CPANOUT	CONTROL PANEL OUTPUT DATA. EACH BIT REPRESENTS THE STATUS OF A PARTICULAR CONTROL PANEL OUTPUT SIGNAL A BIT-VALUE OF 1 = PRESENCE.	NA	*A,K,L,M, KFMT,BPS	NA	NA	WORD	2
CPAOG	COMPUTED START OF A-PHASE GREEN.	CONTR	*Y,P,T,A1	ND	B0	BIT *	4
CPFLG	FLAG SET BY CPU 1 UPON INITIATING THE PROGRAMMED COMPUTER EVALUATION MODE	NA	*L,A	ND	B0	WORD	1
CRTAC1	FLAG SET WHEN BUFFER FOR CRT 1 IS TO BE OUTPUTTED.	NA	*K,CRTOUT	ND	B0	WORD	1
CRTAC2	FLAG SET WHEN BUFFER FOR CRT 2 IS TO BE OUTPUTTED.	NA	*K,CRTOUT	ND	B0	WORD	1
CRTBF1	OUTPUT BUFFER FOR CRT 1	CHAR-ACTER	*Y,A,K,Q, CRTOUT	NA	B0	BYTE	512
CRTBF2	OUTPUT BUFFER FOR CRT 2	CHAR-ACTER	*Y,A,K,Q, CRTOUT	NA	B0	BYTE	512
CRTDC1	CRT 1 DISPLAY CODE. CODE IS: 1=FAIL;2=SYS;3=CON; 4=DET;5=INT;6=BPS SYS; 7=BPS INT	NA	*Y,K,L,M	ND	B0	WORD	1
CRTDC2	CRT 2 DISPLAY CODE. CODE IS: 1=FAIL;2=SYS;3=CON; 4=DET;5=INT;6=BPS SYS; 7=BPS INT	NA	*Y,K,L	ND	B0	WORD	1
CRTERR2	ERROR FLAG FOR CRT TERM'S. WORD 0 IS FOR CRT 2 WORD 1 IS FOR CRT 1	NA	*CRTOUT, K,Q	ND	B0	WORD	2
CRTFL1	FLAG INDICATING OPERATOR SELECTION OF CRT 1 FOR DISPLAY	NA	*Y,A,K,L, M,CRTOUT	ND	B0	WORD	1
CRTFL2	FLAG INDICATING OPERATOR SELECTION OF CRT 2 FOR DISPLAY	NA	*Y,A,K,L, M	ND	B0	WORD	1
CRTNUM	FLAG INDICATING CRT TO WHICH DATA IS SENT. CODE IS: 0 = CRT 2; 1 = CRT 1	NA	*K,CRTOUT	ND	B0	WORD	1

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
CTLSEC	SECTION WIDE CONTROLLER ARRAY	NA	*Y,M	ND	B0	BIT	16
CTLSYS	SYSTEM WIDE CONTROLLER ARRAY	NA	*Y,M	ND	B0	BIT	4
CUROFF	CURRENT OFFSET	CONTR	*Y,K,S,T, U,X	SEC	B1	BYTE	31
CYCLC	CYCLE LENGTH CODES. CODE IS: 0=40SEC,1=50 SEC,2=60 SEC,3=70 SEC,4=80 SEC, 5=90 SEC	CONTR	*Y,D,E,H, K,M,S,U,	ND	B0	BYTE	31
D	BLOCK LENGTH.	LINK	*Y,D,H,I	FT	B0	HALF	136
DACC	15 MINUTE ACCUMULATION OF DELAY.	LINK	*Y,D,H	SEC	B1	HALF	136
DATE	CURRENT DATE IN EBCDIC. IN DATE(0), BYTES 0,1 AND 2 CONTAIN A 3 DIGIT SYMBOL FOR THE MONTH AND BYTE 3 CONTAINS A BLANK. IN DATE(1), BYTE 0 AND 1 CONTAIN THE DAY, BYTE 2 CONTAINS A BLANK AND BYTE 3 CONTAINS THE TENS DIGIT OF THE YEAR. IN DATE(2), BYTE 0 CONTAINS THE UNITS DIGIT OF THE YEAR.	NA	*H,I,J,K, M,Q,Y	SEE DESCR	NA	WORD	3
DAY	DAY COLUMN OF FAILURE STATUS REPORT	NA	H	ND	B0	WORD	0
DAYOWK	DAY OF WEEK. CODES ARE: 1=SAT;2=SUN;3=MON;4=TUE; 5=WED;6=THU;7=FRI	NA	*Y,I,W	ND	B0	WORD	1
DBP	DETECTOR BUFFER POINTER	NA	*Y,A,B, BPS	ND	B0	WORD	1
DCF	DISC CALL FLAG. SET IF A PATTERN HAS BEEN READ IN FOR THE PRESENT SECTION.	NA	*Y,W	ND	B0	WORD	1
DELA	ABSOLUTE VALUE THRESHOLD FOR DETERMINING LINK OUT OF TOLERANCE	NA	H	VPH	B0	WORD	1
DELAY	AVERAGE DELAY PER VEHICLE DURING THE PAST 15 MINUTES.	LINK	*Y,H,J,K	SEC	B4	HALF	136

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
DELDAY	ACCUMULATED DELAY IN A DAY.	LINK	*Y,H,I	SEC	B1	WORD	272
DELP	PERCENT THRESHOLD FOR DETERMINING LINK OUT OF TOLERANCE	NA	H	ND	B16	WORD	1
DETLENG	NUMBER OF DETECTOR FAILURES TO BE LOGGED FROM DETTAB.	NA	*Y,E,K	ND	B0	WORD	1
DETT	NUMBER OF BUS FAILURES (DETECTOR + COMMUNICATIONS)	NA	H	ND	B0	WORD	1
DETTAB	UNIT NUMBER OF EACH FAILED DETECTOR.	SEE DESCR	*Y,E,K	ND	B0	HALF	258
DFAIL	SET WHEN A DETECTOR HAS FAILED ON A LINK.	LINK	*Y,E,H,I, J,K	ND	B0	BYTE	68
DIS	DETECTOR IN STANDBY FLAG. SET WHEN A DETECTOR IS PLACED INTO STANDBY BY OPERATOR	DET	*Y,E,H,K, M,Q	ND	B0	BIT	17
DISKSP	TEMPORARY STORAGE FOR DSPA (DISK STARTING POINTER)	NA	W	ND	B0	WORD	0
DM	CORRECTED CAR COUNTS USED IN SMOOTHING LOGIC	NA	C	VEH	B3	WORD	0
DMALF	DETECTOR FAILURE FLAGS. SET WHEN DETECTOR ELECTRONICS FAILURE IS INDICATED OR WHEN DETECTOR GIVES SPURIOUS EXCESSIVE COUNTS.	DET	*Y,E,H,J, K,M,Q	ND	B0	BIT	17
DMODE	DESIRED MODE. CODE IS: 0 = STANDBY; 1 = MANUAL; 2 = TIME OF DAY; 3 = TRAFFIC RESPONSIVE.	SECT	*Y,H,J,K, M,Q,W	ND	B0	BYTE	1
DOF	DETECTOR OBSTRUCTION FLAG	DET	*Y,C,E	ND	B0	BIT	17
DOFF	DELTA OFFSET TIME	NA	S	SEC	B1	WORD	0
DOT	DATE AND TIME FLAG. WHEN THIS FLAG IS SET, DATE AND TIME ARE PLACED ONTO THE HISTORY TAPE.	NA	BA	ND	B0	WORD	1
DOW	DAY OF WEEK UNLESS HOLIDAY FLAG IS SET FOR EITHER A SAT OR SUN CODE. CODE IS: 1=SAT; 2=SUN; 3=MON; 4=TUE; 5=WED; 6=THUR; 7=FRI	NA	*Y,W,BPS	ND	B0	WORD	1

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
DPATNUM	DESIRED PATTERN NUMBER	SECT	*Y,M,W	ND	B0	BYTE	1
DSGSF	DOWNSTREAM GREEN SIGNAL FLAGS	LINK	*Y,C,D	ND	B0	BIT	17
DSPA	DISK STARTING POINT ADDRESS. INDEX = 96*DOW + FMTODC	INDEX	*Y,W	ND	B0	BYTE	24
DSPP	CURRENT DISK OUTPUT POINTER	NA	W	ND	B0	WORD	1
DT	ARRAY OF DELTA TIME BETWEEN PREDICTED GREEN TIME AND THE STOPS THRESHOLD.	HALF-VEH	*Y,C,D	SEC	B2	BYTE	9
DWL	CONVERTS FROM DETECTOR NUMBER TO LINK NUMBER	DET	*Y,C,F,K, KFMT	ND	B0	HALF	258
DWLP	DETECTOR POSITION. CODE IS ZERO FOR ONLY DET ON LINK, 15 FOR DUMMY DET'S	DET	*Y,C,E	ND	B0	BYTE	129
E	EXTENSION FLAGS SET IF A BUS EXTENSION IS TO BE GRANTED DURING THE CURRENT MOE PERIOD	LINK	*Y,D,BPS	ND	B0	BIT	9
EBCMODE	MODES IN EBCDIC FORMAT 'STBY','MAN','TOD','TRSP'	MODE CODE	H	ND	B0	WORD	4
EBPSAF	FLAG USED AS SIGNAL TO ENTER BPS ALGORITHM	ZONE	BD,BE	ND	B0	BIT	16
EG	EXTENSIONS GRANTED FOR DAY	ZONE	*Y,H,I	ND	B0	HALF	36
EGC	EXTENSION GRANTED CLOCKS SET TO PREVENT GRANTING MORE THAN ONE BUS EXTENSION IN ONE CYCLE.	ZONE	BC,BE	SEC	B1	BYTE	58
EGTS	EXTENSIONS GRANTED (SECTION TOTAL)	NA	*H,I	ND	B0	WORD	1
EGTT	EXTENSIONS GRANTED (SYSTEM TOTAL)	NA	*H,I	ND	B0	WORD	1
EG15	EXTENSION GRANTED COUNT	ZONE	*Y,H,K, BPS	ND	B0	BYTE	64
EMAST	PRIORITY OF RTN E IN MAST	NA	*Y,A,N	ND	B0	WORD	1

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
ENTFLG	FAILURE ENTRY FLAGS. WORD 0 = -1 IF NO CONTROLLER FAILURES TO LOG, = 0 IF SOME TO LOG. WORDS 1-4 = 0 IF NO DET, COMM, BDET, BCOM FAILURES, RESPECTIVELY, TO LOG;NE 0 IF SOME TO LOG.	SEE DESCR	*Y,E,K,P, X,BPS	ND	B0	WORD	5
ENTRYINT	ENTRY INTERVAL. DURATION OF CONTROLLER INTERVALS. INDEX = 16*(CONTROLLER NO.) + (INTERVAL NUMBER)	INDEX	*Y,K,S,T, V,W,X	SEC	B1	BYTE	496
ENTRYOFF	OFFSET AS READ IN FOR EACH PATTERN.	CONTR	*Y,K,M,S, T,W,X	SEC	B1	BYTE	31
EODC	END OF DAY COUNT INDICATES THE NUMBER OF END OF DAY REPORTS	NA	*I,Q,Y	ND	B0	WORD	1
EOFDEL	END OF FILE FLAG	NA	BA	ND	B0	WORD	1
EOTKEY	END OF TAPE FLAG	NA	BA	ND	B0	WORD	1
EPSILON	TEMPORARY STORAGE	NA	X	ND	NA	WORD	0
EPSOF	DIFFERENCE BETWEEN ACTUAL AND WORKING OFFSET.	NA	U	SEC	B1	WORD	0
ESB	ELIGIBLE STOP BUS COUNT FOR DAY	ZONE	*Y,H,I	BUSES	B0	HALF	36
ESBCY	ACCUMULATION OF ELIGIBLE STOP BUSES OVER EACH CYCLE	ZONE	BC,BD,BE	ND	B0	BYTE	32
ESBF	FLAGS SET TO DEFINE ELIGIBLE STOP BUS ENTRY PERIODS	ZONE	BC,BD	ND	B0	BIT	4
ESBT	ELIGIBLE STOP BUS TIME	ZNIN	BD	SEC	B0	BYTE	32
ESBTS	ELIGIBLE STOP BUSES (SECTION TOTAL)	NA	*H,I	ND	B0	WORD	1
ESBTT	ELIGIBLE STOP BUSES (SYSTEM TOTAL)	NA	*H,I	ND	B0	WORD	1
ESB15	15 MINUTE ELIGIBLE STOP BUS COUNT	ZONE	*Y,H,K, BPS	BUSES	B0	BYTE	32
ETB	ELIGIBLE THRU BUS COUNT FOR DAY	ZONE	*Y,H,I	BUSES	B0	HALF	36
ETBCY	ACCUMULATION OF ELIGIBLE THRU BUSES OVER EACH CYLE	ZONE	BC,BD,BE	ND	B0	BYTE	32

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
ETBF	FLAGS SET TO DEFINE ELIGIBLE THRU BUS ENTRY PERIODS	ZONE	BC,BD	ND	B0	BIT	4
ETBPS	BPS IN OPERATION COLUMN OF SYSTEM STATUS REPORT	NA	H	ND	B0	WORD	0
ETBT	ELIGIBLE THRU BUS TIME	ZNIN	BD	SEC	B0	BYTE	32
ETBTS	ELIGIBLE STOP BUSES (SECTION TOTAL)	NA	*H,I	ND	B0	WORD	1
ETBTT	ELIGIBLE THRU BUSES (SYSTEM TOTAL)	NA	*H,I	ND	B0	WORD	1
ETB15	15 MINUTE ELIGIBLE THRU BUS COUNT	ZONE	*Y,H,K, BPS	BUSES	B0	BYTE	32
ETC1C	C1C IN OPERATION COLUMN OF SYSTEM STATUS REPORT	NA	H	ND	B0	WORD	0
EVEN	UPSTREAM STOP AND THRU BUSES DETECTED	NA	BC	ND	NA	WORD	0
EXTGF	EXTENSION GRANTED FLAGS. SET WHEN AN EXTENSION HAS BEEN GRANTED AT THE ASSOCIATED INTERSECTION.	LINK	*Y,D,E	ND	B0	BIT	9
F	COMPARISON FLAG (=0 TURNS ON LINK ARROWS FOR LINKS HAVING PARAMETER VALUES GREATER THAN THRESHOLD; = 1 TURNS ON THOSE HAVING VALUES LESS THAN THRESHOLD).	NA	J	ND	B0	BIT	0
FAIL	15 MINUTE PERIODS THAT DETECTORS OR COMMUNICATIONS HAVE FAILED	ZONE	*Y,H,I	ND	B0	BYTE	18
FAILTAB	FAILURE TABLE. FORMAT IS DESCRIBED IN RTN K SPEC.	SEE DESCR	*Y,H,K,M, KFMT,Q	SEE DESCR	NA	WORD	800
FAILTB	EQUATED TO FAILTAB						
FESBF	1ST ELIGIBLE STOP BUS FLAG	ZONE	BC,BD	ND	B0	BIT	4
FETBF	1ST ELIGIBLE THRU BUS FLAG	ZONE	BC,BD	ND	B0	BIT	4
FFS	FREE FLOW LINK SPEED.	TTSA-SI	*Y,D	FT/ SEC	B0	HALF	3
FLAG2	FLAG TO INDICATE LOGIC PATHS FOR PROGRAM TO TAKE	NA	L,BJ	ND	B0	WORD	1

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
FLAG6	LOGIC FLAG FOR SPECIAL TREATMENT OF CONTR. NO.17	NA	BD	ND	B0	WORD	1
FLERFL	FAILURE ACK/REP ERROR FLAG	NA	*Y,K,M, KFMT	ND	B0	WORD	1
FMC	FIFTEEN MINUTE COUNTER	NA	*Y,A	SEC	B0	WORD	1
FMFBPS	FIFTEEN MINUTE FLAG FOR BPS	NA	*Y,A,H, BPS	ND	B0	WORD	1
FMMARK	FIFTEEN MINUTE MARK. INDICATES THAT RTN W SHOULD PROCESS ALL SECTIONS.	NA	*Y,A,W	ND	B0	WORD	1
FMSECF	15 MINUTE SECTION FLAG	NA	*Y,A,M,W	ND	B0	WORD	1
FMSYSF	15 MINUTE SYSTEM FLAG	NA	*Y,A,M,W	ND	B0	WORD	1
FMTCHG	CRT FORMATTING CHANGE PARAMETER.	NA	*M,H,K, KFMT	ND	B0	WORD	1
FMTNUM	CRT FORMATTING NUMBER PARAMETER.	NA	*M,H,K, KFMT	ND	B0	WORD	1
FMTODC	FIFTEEN MINUTE TIME OF DAY COUNT. REFERENCE IS MIDNIGHT. INCREMENTED EVERY 15 MINUTES MOD 96.	NA	*Y,A,H,I, W,BPS	ND	B0	WORD	1
FMTTYP	CRT FORMATTING TYPE PARAMETER.	NA	*M,H,K, KFMT	ND	B0	WORD	1
FMT1	COUNT FOR WHICH FMTODC IS EQUAL TO START OF MORNING RUSH HOUR	NA	BC	ND	B0	WORD	1
FMT2	COUNT FOR WHICH FMTODC IS EQUAL TO END OF MORNING RUSH HOUR	NA	BC	ND	B0	WORD	1
FMT3	COUNT FOR WHICH FMTODC IS EQUAL TO START OF EVENING RUSH HOUR	NA	BC	ND	B0	WORD	1
FMT4	COUNT FOR WHICH FMTODC IS EQUAL TO END OF EVENING RUSH HOUR	NA	BC	ND	B0	WORD	1

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
FPPF	FIRST PASS PARAMETER FLAG. CODE IS: 0 = W HAS BEEN ENTERED AT LEAST 2 TIMES SINCE START-UP; 1 = W HAS BEEN ENTERED 1 TIME SINCE START-UP; 2 = FIRST TIME W HAS BEEN ENTERED SINCE START-UP.	NA	*Y,W	ND	B0	WORD	1
FSETCF	OFFSET CHANGE FLAGS. SET WHEN THERE IS A CHANGE IN OFFSET DUE TO OPERATOR REQUEST, OR CORRECTIVE ACTION IS IN PROGRESS.	CONTR	*Y,G,M,T, U,V,X	ND	B0	BIT *	4
FSETF	EQUATED TO FSETCF						
FSTFLG	FIRST START FLAG	NA	*Y,M	ND	B0	WORD	1
FTAB	BYTE INDEX POINTS TO 1ST BYTE OF NEXT AVAILABLE ENTRY IN FAILTAB.	NA	*K,Q,Y, KFMT	ND	B0	WORD	1
FTABWRD	WORD INDEX POINTS TO 2ND WORD OF NEXT AVAILABLE ENTRY IN FAILTAB.	NA	*K,KFMT,Q	ND	B0	WORD	1
FW	TEMPORARY STORAGE	NA	BF	ND	NA	WORD	0
FWL	TEMPORARY STORAGE	NA	BF	ND	NA	WORD	0
GA	CALCULATED DURATION OF A-PHASE GREEN PLUS AMBER	NA	S	SEC	B1	WORD	0
GAB	2-PHASE SUBROUTINE STORAGE FOR GABBCABC VALUE	NA	M,V	SEC	B1	WORD	0
GABBCABC	GAB(BYTE 0), GBC(BYTE 1) AND GABC(BYTE 2) ARE THE AMOUNTS OF TIME AVAILABLE FOR A-PHASE, B-PHASE AND C-PHASE GREEN, RESPECTIVELY. TKMIN(BYTE 3) CONTAINS THE MINIMUM TRANSITIONAL CYCLE LENGTH DURATION.	CONTR	*Y,M,S,V, W	SEC	B1 (EACH BYTE)	WORD	124
GABC	TEMPORARY STORAGE FOR GABBCABC VALUE	NA	V	SEC	B1	WORD	0
GABCP	TIME FOR A, B, AND C PHASE GREEN PLUS AMBER DURING A TRANSITION CYCLE	NA	S	SEC	B1	WORD	0

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
GABP	TIME FOR A AND B PHASE GREEN PLUS AMBER DURING A TRANSITION CYCLE	NA	S	SEC	B1	WORD	0
GAI	A-PHASE GREEN RETURN INPUT. EACH BIT REPRESENTS THE STATUS OF A PARTICULAR A-PHASE GREEN RETURN SIGNAL. A BIT-VALUE OF 0 = PRESENCE.	CONTR	*A,N	ND	B0	BIT *	8
GAMIN	TEMPORARY STORAGE FOR GMINABC4 VALUE	NA	M,V	SEC	B1	WORD	0
GAP	PRESENT GAP LENGTH ON DETECTOR BEING PROCESSED	NA	E	SEC	B5	WORD	0
GAP1	A-PHASE GREEN RETURN INPUT BUFFER POINTER	NA	O	ND	NA	WORD	1
GATEMP	CONTROL PANEL THUMBWHEEL VALUE OF A-PHASE GREEN (BINARY)	NA	M	SEC	B1	WORD	0
GAW	TEMPORARY STORAGE FOR CONTROLLER INTERVAL DURATION	NA	M,V	SEC	B1	WORD	0
GAWTEMP	OPERATOR ADJUSTED A-PHASE GREEN.	CONTR	*Y,M,T	SEC	B1	BYTE	31
GA1	A-PHASE GREEN RETURN INPUT BUFFER NO.1	CONTR	O	ND	NA	BIT *	8
GA2	A-PHASE GREEN RETURN INPUT BUFFER NO.2	CONTR	O	ND	NA	BIT *	8
GB	CALCULATED DURATION OF B PHASE GREEN PLUS AMBER	NA	S	SEC	B1	WORD	0
GBMIN	TEMPORARY STORAGE FOR GMINABC4 VALUE	NA	M,V	SEC	B1	WORD	0
GBTEMP	CONTROL PANEL THUMBWHEEL VALUE OF B-PHASE GREEN (BINARY)	NA	M	SEC	B1	WORD	0
GBW	TEMPORARY STORAGE FOR CONTROLLER INTERVAL DURATION	NA	M,V	SEC	B1	WORD	0
GBWTEMP	OPERATOR ADJUSTED B-PHASE GREEN.	CONTR	*Y,M,T	SEC	B1	BYTE	31
GB1	TEMPORARY STORAGE FOR GB OUTPUT OF 2-PHASE ROUTINE	NA	V	SEC	B1	WORD	0

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
GB2	TEMPORARY STORAGE FOR GB OUTPUT OF 2-PHASE ROUTINE	NA	V	SEC	B1	WORD	0
GC	CALCULATED DURATION OF C PHASE GREEN PLUS AMBER	NA	S	SEC	B1	WORD	0
GCMIN	TEMPORARY STORAGE FOR GMINABC4 VALUE	NA	V	SEC	B1	WORD	0
GDA	GREEN DEMAND FOR 1ST A-LINK	NA	V	SEC	B1	WORD	1
GDA2	GREEN DEMAND FOR 2ND A-LINK	NA	V	SEC	B1	WORD	0
GDB	GREEN DEMAND FOR 1ST B-LINK	NA	V	SEC	B1	WORD	1
GDB2	GREEN DEMAND FOR 2ND B-LINK	NA	V	SEC	B1	WORD	0
GDC	GREEN DEMAND FOR C-LINK	NA	V	SEC	B1	WORD	1
GD1	2-PHASE SUBROUTINE STORAGE FOR 1ST LINK GREEN DEMAND	NA	V	SEC	B1	WORD	0
GD2	2-PHASE SUBROUTINE STORAGE FOR 2ND LINK GREEN DEMAND	NA	V	SEC	B1	WORD	0
GGRNLN	ARRAY LISTING MOE LINKS ARRANGED BY THE MOE PERIOD AT THE END OF WHICH THEY GO GREEN	GGR-NSI	BE	ND	B0	HALF	36
GGRNSI	LOCATION OF FIRST GOING GREEN LINK IN GGRNLN ARRAY	MOE PER.	BE	ND	B0	BYTE	13
GI	FIRST GOING RED ZONE INDEX FOR GREDZN ARRAY	GRED-SI	BE	ND	B0	WORD	0
GLABC	GLA(BYTE 0), GLB(BYTE 1) AND GLC(BYTE 2) ARE THE LOWER THRESHOLDS FOR THE GREEN DEMAND ON PHASES A, B AND C, RESPECTIVELY. BYTE 3 IS BLANK.	CONTR	*Y,V,W	SEC	B1 (EACH BYTE)	WORD	124
GMINABC4	GAMIN(BYTE 0), GBMIN(BYTE 1) AND GCMIN(BYTE 2) ARE THE MINIMUM ALLOWABLE DURATIONS OF A-PHASE, B-PHASE AND C-PHASE GREEN, RESPECTIVELY. G4MIN(BYTE 3) IS THE MINIMUM ALLOWABLE MINOR ADJUSTABLE INTERVAL DURATION.	CONTR	*Y,K,S,V, W	SEC	B1 (EACH BYTE)	WORD	124
GPT	TEMPORARY STORAGE	NA	G	SEC	B1	WORD	0
GREDSI	LOCATION OF FIRST GOING RED ZONE IN GREDZN ARRAY	MOE PER.	BE	ND	B0	BYTE	13

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
GREDZN	ARRAY LISTING ALL ZONES ARRANGED BY MOE PERIOD AT END OF WHICH THEY GO RED	GRED-SI	BE	ND	B0	BYTE	18
GSLIM	FIRST GOING RED ZONE INDEX (GI) LIMIT	GRED-SI	BE	ND	B0	WORD	0
GT	TEMPORARY STORAGE USED IN GREEN RETURN CALCULATIONS	NA	0	ND	NA	BIT	0
GUABC	GUA(BYTE 0), GUB(BYTE 1) AND GUC(BYTE 2) ARE THE UPPER THRESHOLDS FOR THE GREEN DEMAND ON PHASES A, B AND C, RESPECTIVELY. BYTE 3 IS BLANK.	CONTR	*Y,B,W	SEC	B1 (EACH BYTE)	WORD	124
G1MIN	2-PHASE SUBROUTINE STORAGE FOR MINIMUM DURATIONS	NA	V	SEC	B1	WORD	0
G12	TEMPORARY STORAGE FOR GABBCABC VALUE	NA	V	SEC	B1	WORD	0
G2MIN	2-PHASE SUBROUTINE STORAGE FOR MINIMUM DURATIONS	NA	V	SEC	B1	WORD	0
HB	TOTAL OF HELPED STOP AND THRU BUSES PER CYCLE ARRAY	GRED-ZN	BE	BUSES	B0	BYTE	32
HBUFLNG	LENGTH OF HISTORY BUFFER: NPATBYT4 + 256*NRESPAT	NA	*Y,W	ND	B0	WORD	0
HMAST	PRIORITY OF RTN H IN MAST	NA	*Y,A,H,M	ND	B0	WORD	1
HOLD	FLAGS INDICATING IF CONTROLLER IS UNDER COMPUTER CONTROL. EACH BIT REPRESENTS THE STATUS OF A PARTICULAR CONTROLLER ON-LINE SIGNAL. A BIT-VALUE OF 1 = PRESENCE.	CONTR	*A,A1,H,I, J,K,M,P, Q,R,T,V, X		B0	BIT *	4
HOLDTEMP	ON-LINE FIXED TIME CONTROLLER INDICATION	NA	T	ND	NA	BIT	1
HOLIDF	HOLIDAY FLAG. CODE IS: 0 = NO HOLIDAY 1 = SATURDAY TYPE HOLIDAY 2 = SUNDAY TYPE HOLIDAY	NA	*Y,I,W	ND	B0	WORD	1

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
HOLIDTBL	HOLIDAY TABLE LISTING DATE AND CODE TYPE OF EACH HOLIDAY. IN HOLIDTBL(0), BYTES 0,1,AND 2 CONTAIN A 3 DIGIT CODE FOR THE MONTH, AND BYTE 3 CONTAINS A BLANK. IN HOLIDTBL(1), BYTES 0 AND 1 CONTAIN THE DAY, BYTE 2 CONTAINS A BLANK AND BYTE 3 CONTAINS THE TENS DIGIT OF THE YEAR. IN HOLIDTBL(2), BYTE 0 CONTAINS THE UNITS OF THE YEAR, BYTE 1 CONTAINS A BLANK, AND BYTE 2 CONTAINS THE CODE TYPE. THE CODE IS: 1 = SAT TYPE; 2 = SUN TYPE. STORAGE IS PROVIDED FOR 32 HOLIDAYS.	SEE DESCR	*Y,I,Q	ND	B0	WORD	96
HPATNUM	TEMPORARY STORAGE FOR HSBUF VALUE	NA	W	ND	NA	WORD	0
HRF	HISTORY RECORD FLAG. SET IN RTN M TO INITIATE RECORDING OF RAW DETECTOR DATA ON TAPE.	NA	*Y,H,K,M, BPS	ND	B0	WORD	1
HRFA	HISTORY TAPE RECORDING FLAG	NA	BA	ND	B0	WORD	1
HSARR	HALF-SECOND ARRAY. CONTAINS A-PHASE GREEN INPUT (16 WORDS), CONTROL PANEL INPUT (10 WORDS), RADIO-SYNCH (2 WORDS) & HOLD (8 WORDS). DATA IS INTERLEAVED WITH CMMDS.	NA	*A,BPS	ND	B0	BIT *	36
HSB	ELIGIBLE HELPED STOP BUS COUNT FOR DAY	ZONE	*Y,H,I	BUSES	B0	HALF	36
HSBCY	NUMBER OF HELPED STOP BUSES PER CYCLE	ZONE	BD,BE	ND	B0	BYTE	32
HSBTS	HELPED STOP BUSES (SECTION TOTAL)	NA	*H,I	ND	B0	WORD	1
HSBTT	HELPED STOP BUSES (SYSTEM TOTAL)	NA	*H,I	ND	B0	WORD	1
HSBUF	HISTORY SELECTION BUFFER. SEE RTN W SPECIFICATION. (FIG. 2.24.2.1)	NA	*Y,M,W	ND	NA	BYTE	268
HSB15	15 MINUTE COUNT OF HELPED STOP BUSES	ZONE	*Y,H,K, BPS	BUSES	B0	BYTE	32

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
HSDEL	HALF SECOND DELAY FLAG	NA	BA	ND	B0	WORD	1
HTB	ELIGIBLE HELPED THRU BUS COUNT FOR DAY	ZONE	*Y,H,I	BUSES	B0	HALF	36
HTBCY	NUMBER OF HELPED THRU BUSES PER CYCLE	ZONE	BD,BE	ND	B0	BYTE	32
HTBTS	HELPED THRU BUSES (SECTION TOTAL)	NA	*H,I	ND	B0	WORD	1
HTBTT	HELPED THRU BUSES (SYSTEM TOTAL)	NA	*H,I	ND	B0	WORD	1
HTB15	15 MINUTE COUNT OF HELPED THRU BUSES	ZONE	*Y,H,K, BPS	BUSES	B0	BYTE	32
I	DO LOOP WORD INDEX	NA	*Y,A1,G, U,V,X P,R,S,T,	ND	B0	WORD	1
IADVP	INTERVAL ADVANCE PULSE TEMPORARY STORAGE.	CONTR	*Y,A1,P, T,X	ND	B0	BIT *	4
IB	CYCLE NUMBER INDEX	NA	*E,F	ND	B0	WORD	1
IBL	CHANGE TABLE INDEX	NA	H	ND	B0	WORD	1
IBRANIND	BRANCH INDEX POINTS TO THE STARTING ADDRESS OF RTN I.	NA	I	ND	B0	WORD	1
IC	CONTROLLER INTERVAL NUMBER TO BE REDUCED	NA	D	ND	B0	WORD	0
IG	CALCULATE BPS INTERSECTION GAIN	NA	BE	PASS-MIN	B0	HALF	116
IGEF	INTERSECTION GAIN SBRTN. ENTRY FLAG. (0=NO,1=YES)	NA	BE	ND	B0	WORD	1
IGMIN	MINIMUM VALUE OF IG FOR WHICH A BPS EXTENSION IS GRANTED	NA	BE	PASS-MIN	B0	WORD	1
IG15	CURRENT 15 MINUTE INTER-SECTION GAIN	ZONE	*Y,H,K, BPS	PASS-MIN	B0	HALF	64
IL	LINK NUMBER	NA	*E,F	ND	B0	WORD	1
IM	MOE PERIOD NUMBER TO BE REDUCED	NA	D	ND	B0	WORD	0
IMAST	PRIORITY OF RTN I IN MAST.	NA	*Y,A,H,I	ND	B0	WORD	1

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
INH	15 MINUTE PERIODS THAT BPSIF IS SET	ZONE	*Y,H,I	ND	B0	BYTE	18
INHIBITE	INHIBIT ROUTINE E FLAG.	NA	*Y,E,H	ND	B0	WORD	1
INHT	NUMBER OF INTERSECTIONS THAT ARE IN INHIBITED MODE	NA	H	ND	B0	WORD	1
INTDUR	INTERVAL DURATION ARRAY INDEX = CONTROLLER INTERVAL NUMBER + 16*(CONTROLLER NO.)	INDEX	*Y,K,S,T, V,X	SEC	B1	BYTE	496
INTERVH	HIGHEST INTERVAL NUMBER	CONTR	*Y,P,T	ND	B0	BYTE	31
INTERV2	2ND INTERVAL BEYOND END OF A-PHASE GREEN.	CONTR	*Y,P,T	ND	B0	BYTE	31
INTNUM	INTERVAL NUMBER	CONTR	*Y,T,X	ND	B0	BYTE	31
INTNUML	PREVIOUS INTERVAL NUMBER	CONTR	*Y,P,T	ND	B0	BYTE	31
INTOUT	ADVANCE PULSE COUNTER	CONTR	*Y,P	ND	B0	BYTE	32
INTREDF	CONTROLLER INTERVAL REDUCTION FLAGS. FLAGS INDICATING THAT THE CONTROLLER INTERVAL IS TO BE REDUCED BY AN AMOUNT EQUAL TO THE CURRENT WORKING EXTENSION.	CONTR INTER.	*Y,D,T	ND	B0	BIT/ HALF	62
INTRNUM	INTERSECTION NUMBER FROM RTN M. WORD 0 IS FOR CRT 2 AND WORD 1 IS FOR CRT 1	NA	*K,M	ND	B0	WORD	
INT1SF	INTERVAL 1 START FLAG.	CONTR	*Y,A1,T,V	ND	B0	BIT *	4
INT1SHFB	FLAGS INDICATING THE BEGINNING OF A-PHASE GREEN USED FOR BUS RTNS	CONTR	*Y,V,BPS	ND	B0	BIT *	4
INT1SHF1	INTERVAL 1 START-HOLD FLAG 1. SET AT THE BEGINNING OF A-PHASE GREEN AND RESET WHEN THE MOE1 PERIOD IS LOADED.	CONTR	*Y,D,T	ND	B0	BIT *	4
INT1SHF2	INTERVAL 1 START-HOLD FLAG 2. SET AT THE BEGINNING OF A-PHASE GREEN AND RESET WHEN THE MOE2 PERIOD IS LOADED.	CONTR	*Y,D,T	ND	B0	BIT *	4
I1	CURRENT MOE1 PERIOD NUMBER	CONTR	*Y,D	ND	B0	HALF	62

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
I1B	CURRENT BUS MOE1 PERIOD NUMBER	CONTR	BD,BE	ND	B0	HALF	116
I2	CURRENT MOE2 PERIOD NUMBER	CONTR	*Y,D	ND	B0	HALF	62
I2BR	CURRENT BUS MOE1 PERIOD NUMBER	CONTR	BE	ND	B0	BYTE	74
JCOUNT	PASS COUNTER FOR J(6 SEC)	NA	*A,J	ND	B0	WORD	1
JJ	SECTION NUMBER	NA	*Y,M,W	ND	B0	WORD	1
JMAST	PRIORITY OF RTN J IN MAST	NA	*Y,A,M	ND	B0	WORD	1
K	INDEX INDICATING THE FIRST CONTROLLER NUMBER OF THE CURRENT GROUP OF 32 BEING PROCESSED BY THE CONTROLLER DO-LOOP ROUTINES.	NA	*Y,A1,P, R,S,T,U, V,X	ND	B0	WORD	1
KCL	DURATION OF EACH CYCLE LENGTH	CYCLC	*Y,H,K,M, N,S,U,X, BPS	SEC	B1	WORD	16
KCNT	TIME TIL NEXT CRT UPDATE	NA	*A,K	SEC	B0	WORD	1
KCSF	CYCLE K START FLAGS. SET WHEN KTH CYCLE STARTS.	CYCLC	*N,E	ND	B0	BIT	1
KCTC	KTH CYCLE TIME COUNTERS CONTAIN TIME REMAINING IN CYCLE.	CYCLC	*N,S,U,X	SEC	B1	WORD	17
KCTF	KTH CYCLE TIMING FLAG. FLAG SET FOR EACH CYCLE TO INDICATE THAT SYNCH. HAS BEEN OBTAINED WITH THE MASTER SYNCH. PULSES.	CYCLC	*N,K	ND	B0	BIT	1
KH	TEST NEW/NOW RATIO COMPARISON CONSTANT.	NA	*Y,W	ND	B8	WORD	1
KHPS	1/3600 CONSTANT CONVERTS SECONDS TO HOURS.	NA	*Y,D	HRS/ SEC	B28	WORD	1
KMAST	PRIORITY OF RTN K IN MAST	NA	*Y,A,E,K, L,M,P,X, BPS	ND	B0	WORD	1
KMCSP	KTH MASTER CONTROLLER SYN-CHRONIZATION PULSES.	CYCLC	*A,N	ND	B0	BIT	1
KN	QUEUE SMOOTHING CONSTANT	NA	C	ND	B8	WORD	1

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
KNEW	DETECTOR BEING PROCESSED	NA	*Y,B,C	ND	B0	WORD	1
KOCC	OCCUPANCY WEIGHTING FACTOR	NA	*Y,W	VEH/ HR	B2	WORD	1
KPCO	PERCENT OCCUPANCY SMOOTHING FILTER GAIN. IB IS CYCLE NUMBER INDEX.	IB	*F	ND	B3	WORD	6
KPW	PULSE DURATION SMOOTHING CONSTANT	NA	C	ND	B8	WORD	1
KQ1	SMOOTHING FILTER GAIN FOR QBAR AT START OF LINK GRN.	NA	*Y,D	ND	B31	WORD	1
KQ2	SMOOTHING FILTER GAIN FOR QCIC AT START OF LINK GRN.	NA	*Y,D	ND	B31	WORD	1
KS	SMOOTHING FILTER GAIN FOR STOPS.	NA	*Y,D	ND	B31	WORD	1
KSP	SPEED SMOOTHING FILTER GAIN. IB IS CYCLE NUMBER INDEX.	IB	*F	ND	B3	WORD	6
KVPH	VOLUME SMOOTHING FILTER GAIN. IB IS CYCLE NUMBER INDEX.	IB	*F	ND	B3	WORD	6
KVO	SMOOTHING FILTER GAIN FOR VO	NA	*Y,D	ND	B31	WORD	1
KV1	CONVERTS RECIPROCAL OF PULSE LENGTH(/SEC) TO SPEED(MPH).	NA	*F,H	SEC-MPH	B2	WORD	1
KV2	=.6818182 USED TO CALCULATE AVERAGE SPEED	NA	H	ND	B16	WORD	1
KW	OCCUPANCY WEIGHTING FACTOR.	NA	*Y,H	VEH/ HR	B0	WORD	1
K3PH	TYPE OF CIC CONTROL. CODE IS: 0 = 2 CRITICAL MOVEMENTS AND NO OVERLAPPING(TYPE A); 1 = 3 NON-OVERLAPPING MOVEMENTS(TYPE B); 2 = 3 MOVEMENTS WHERE THE A AND C PHASES OVERLAP(TYPE C); 3 = 3 MOVEMENTS WITH B AND C PHASES OVERLAPPING(TYPE D).	CONTR	*Y,S,V	ND	B0	BYTE	31
LAG	LAGGING CONTROLLERS	NA	P	ND	NA	BIT	0
LC	EFFECTIVE NUMBER OF LANES PER ZONE	ZONE	BE	ND	B0	BYTE	64
LCCRT	EQUATED TO LNKCON						

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
LCCRTB	ARRAY LISTING CONTROLLER NUMBERS CORRESPONDING TO EACH ZONE	ZONE	BC	ND	B0	BYTE	18
LDSET	LINK START ENTRY	CONTR	*Y,V	ND	B0	BYTE	123
LEAD	LEADING CONTROLLERS	NA	P	ND	NA	BIT	0
LFDPN	LENGTH FOR DESIRED PATTERN NUMBER. NUMBER OF WORDS IN PATTERN.	PAT NO.	*Y,W	ND	B0	HALF	2
LIM	UPPER LIMIT OF CONTROLLER INDEX FOR SECTION	BA	H	ND	B0	WORD	0
LIMRC	LIMIT VALUE FOR RC15 ABOVE WHICH UPSTREAM BUS DETECTOR FAILURE IS INDICATED	NA	BC	ND	B0	WORD	1
LIMZC	LIMIT VALUE FOR ZCCY ABOVE WHICH DOWNSTREAM BUS DETECTOR FAILURE IS INDICATED	NA	BC	ND	B0	WORD	1
LINKDI	DIRECTION FOR EACH LINK: 0=N; 1=S; 2=E; 3=W; 4=NE; 5=NW; 6=SE; 7=SW; 8=EO	LINK	*Y,H,K	ND	B0	BYTE	68
LINKPH	EQUATED TO LNKPT						
LINKSI	1ST LINK INDEX NUMBER FOR SECTION IN SECTLKN	SECT	*Y,I,W	ND	B0	HALF	3
LL	OCCUPANCY CORRECTION FACTOR	NA	*F,H	ND	B16	WORD	1
LMAP	LABEL EQUATED TO MARR.						
LMAST	PRIORITY OF RTN L IN MAST.	NA	*Y,A,L	ND	B0	WORD	1
LNKARW	LINK ARROW DISPLAY ARRAY	LINK	J	ND	NA	BYTE	123
LNKCON	CONVERTS FROM LINK NO'S TO CONTROLLER NUMBERS	LINK	*Y,D,H,I, K,KFMT, M,BPS	ND	B0	BYTE	68
LNKPT	LINK PHASE TABLE. PHASE IN WHICH TRAFFIC FLOWS. CODES ARE: A1=000;A2=001;B1=010; B2=011;C=100;D=110	LINK	*Y,D,K	ND	B0	BYTE	68
LNKSPEED	LINK SPEED. TOTAL ACCUMULATION PER CYCLE OF RAW SPEEDS OF ALL DETECTORS ON LINK.	NA	*Y,E,F	/SEC	B4	WORD	1

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
LNKZONE	ARRAY LISTING ZONE NUMBERS CORRESPONDING TO EACH LINK	LINK	BF	ND	B0	BYTE	64
LPBUF	LINE PRINTER BUFFER	NA	*H,I	ND	NA	WORD	1806
LPCLOCK	LINE PRINTER TIME-OUT COUNTER. PROGRAM END-ACTION SIMULATION IF COUNT IS EXCESSIVE.	NA	*A,H	SEC	B0	WORD	1
LSI	1ST LINK INDEX NUMBER FOR EACH CONTROLLER IN ARRAY CONTLN	CONTR	*Y,K,V,W, BPS	ND	B0	HALF	63
L1COUNT	LEVEL 1 TASK COUNT. INCREMENTED BY INTERPROCESSOR TASK. DECREMENTED BY LEVEL 1 TASK.	NA	BA	ND	B0	WORD	1
L2COUNT	LEVEL 2 TASK COUNT	NA	BA	ND	B0	WORD	1
MARR	OUTPUT CODE WORDS INTERLEAVED WITH DATA ARRAY MARR1 MAP ARRAY CONSISTING OF	NA	*A,J,Y	ND	B0	BIT *	840
MARR1	LABEL EQUATED TO MARR+1						
MASK	32 ONE BIT MASKS. MASK(K) HAS THE KTH BIT EQUAL '1' AND ALL OTHER BITS EQUAL '0'	BIT INDEX	*N,A,D,H, K,L,M,I, T,W,X,Y, KFMT,BPS	ND	NA	WORD	32
MASKE	MASK FOR EVEN BITS (2,4,..)	NA	BC	ND	NA	WORD	1
MASKO	MASK FOR ODD BITS (1,3,..)	NA	BC	ND	NA	WORD	1
MAST	MASTER ACTIVITY SCAN TABLE. BITS 0,1, AND 2 CONTAIN THE ACTIVITY, SERVICE AND CONTROL BITS, RESPECTIVELY. BITS 15-31 CONTAIN THE ADDRESS OF THE LEVEL 3 RTN. THE WORDS ARE ARRANGED WITH THE HIGHEST PRIORITY AT THE TOP OF THE TABLE. THE PRIORITY ORDER IS: M,J,K,E,H,W,Q,I,L	PRIORITY	*Y,A,E,H, I,J,K,L, M,N,P,W, X,BPS	ND	SEE DESCR	WORD	9
MAXNC	EQUATED TO NUMCTL						
MAXNLKS	EQUATED TO NUMLNK						
MAXNZNS	MAXIMUM NUMBER OF BUS ZONES IN SYSTEM	NA	*Y,H,I,M, BPS	ND	B0	WORD	1
MAXPOS	BUS DETECTOR PRESENCE MAXIMUM TIME VALUE	NA	BC	SEC	B5	WORD	0
MB	BUS MODEL PERIOD NUMBER	I1B	BE	ND	B0	WORD	0

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
MCDF	MODE CHANGE DESIRED FLAG	NA	*Y,M,W	ND	B0	BIT	1
M1	NUMBER OF TRANSITION CYCLES REMAINING.	CONTR	*Y,D,K,M, P,Q,R,S, T	ND	B0	BYTE	31
MMAST	PRIORITY OF RTN M IN MAST.	NA	*Y,A	ND	B0	WORD	1
MNUMBF	MAXIMUM NUMBER OF FAILURES IN FAILTAB	NA	*Y,H,K KFMT	ND	B0	WORD	0
MODE$	CURRENT OPERATING MODE CODE IS: 0 = STANDBY; 1 = MANUAL; 2 = TIME OF DAY; 3 = TRAFFIC RESPONSIVE	SECT	*Y,H,K,M, W	ND	B0	BYTE	1
MOEIF	MOE INACTIVE FLAGS GIVING FAILURE STATUS. CODE EQUAL TO '0' IF NO FAILURE WAS PRESENT FOR MORE THAN ONE CYCLE, EQUAL TO '1' IF FAILURE WAS CORRECTED FOR ONE CYCLE ONLY, EQUAL TO '2' IF THERE IS A FAILURE PRESENT	LINK	*Y,C,D,E, H,I,K,W	ND	B0	BYTE	68
MOERRCR	MOE PERIOD REDUCTION CROSS REFERENCE. MOE PERIOD NUM. THAT MUST BE REDUCED IF A BUS EXTENSION IS GRANTED IN THE PRESENT MOE1 PERIOD.	MOE PER	*Y,D,BPS	ND	B0	HALF	161
MOEPSI	LOCATION OF 1ST MOE PERIOD	CONTR	*Y,D,G,U, BPS	ND	B0	HALF	62
MOETMP	TEMPORARY STORAGE FOR DURATION OF ADJUSTABLE MOE1 PERIOD	NA	G	SEC	B1	WORD	0
MOETP2	TEMPORARY STORAGE FOR DURATION OF ADJUSTABLE MOE2 PERIOD	NA	G	SEC	B1	WORD	0
MOE1CF	FLAGS SET WHEN FIRST MOE1 PERIOD HAS BEEN LOADED INTO BPS MOE1 CLOCKS	CONTR	BD	ND	NA	BIT *	8
MOE1CLK	CLOCKS USED TO COUNT DOWN THE MOE1 PERIODS.	CONTR	*Y,D	ND	B1	BYTE	31
MOE1CLKB	BPS MOE1 CLOCKS	CONTR	BD,BE	SEC	B1	BYTE	58
MOE1FTTF	FLAGS SET AFTER GRANTING A BUS PRIORITY EXTENSION TO CALL UP 2ND INTERSECTION GAIN PASS.	CONTR	BE	ND	B0	BIT	16

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
MOE1GLN	NUMBER OF LINK WHICH WILL HAVE DOWNSTREAM GREEN OR AMBER SIGNAL AT END OF PRESENT MOE1 PERIOD	MOE1 PER	*Y,D	ND	B0	HALF	161
MOE1P	MOE1 PERIOD DURATIONS FOR EACH CONTROLLER	MOEP-S1	*Y,G,U, BPS	SEC	B1	BYTE	81
MOE1PRF	MOE1 PERIOD REDUCTION FLAG. FLAGS INDICATING THAT THE CORRESPONDING MOE1 PERIOD IS TO BE REDUCED BY AN AMOUNT EQUAL TO THE CURRENT WORKING EXTENSION.	MOE PER	*Y,D	ND	B0	BIT	21
MOE1RLN	MOE1 RED LINK NUMBER. NUMBER OF LINK WHICH WILL HAVE DOWNSTREAM RED AT END OF PRESENT MOE1 PERIOD.	MOE1 PER	*Y,D	ND	B0	HALF	161
MOE2CLK	CLOCKS USED TO COUNT DOWN BPS MOE1 PERIOD	CONTR	*Y,D	ND	B1	BYTE	31
MOE1ZF	FLAGS SET AT END OF THE MOE2 PERIODS.	CONTR	BD,BE	ND	B0	BIT *	8
MOE2GLN	MOE2 GREEN LINK NUMBER LINK NUMBER HAVING GREEN OR AMBER SIGNAL AT END OF PRESENT MOE2 PERIOD.	MOE PER	*Y,D	ND	B0	HALF	161
MOE2P	MOE2 PERIOD DURATIONS FOR EACH CONTROLLER.	MOEP-S1	*Y,D,G,U	SEC	B1	BYTE	81
MOE2PRF	MOE2 PERIOD REDUCTION FLAG. FLAGS INDICATING THAT THE CORRESPONDING MOE2 PERIOD IS TO BE REDUCED BY AN AMOUNT EQUAL TO THE CURRENT WORKING EXTENSION.	MOE PER	*Y,D	ND	B0	BIT	21
MOE2RLN	MOE2 RED LINK NUMBER. LINK NUMBER HAVING RED SIGNAL AT END OF PRESENT MOE2 PER.	MOE PER	*Y,D	ND	B0	HALF	161
MONTH	MONTH COLUMN OF FAILURE STATUS REPORT	NA	H	ND	B0	WORD	0
MOVTAB	SHUTDOWN/STARTUP TABLE CONTAINING THE ARRAYS TO BE SAVED/RESTORED	NA	*Y,Q	ND	B0	HALF	8
MPOKEY	MUST PRINT OUT KEY. SET WHEN CHNGTBL IS FULL.	NA	*H,A	ND	B0	WORD	1

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
MTHLD	INTEGER VALUE OF PARAMETER THRESHOLD.	NA	J	ND	NA	WORD	0
MVPLUSKO	MEASURED VOLUME PLUS WEIGHTED OCCUPANCY	NA	H	VPH	B0	WORD	1
M1	MULTIPLYING FACTOR OF NORMAL DETECTOR GAP LENGTH USED FOR ISOLATING DETECTOR OBSTRUCTION OR MALFUNCTION.	NA	*Y,E	VEH	B6	WORD	1
NAI	NUMBER OF ACTIVE BUS INTERSECTIONS	SECT	*Y,K	ND	B0	BYTE	1
NAMOEP	NUMBER OF ADJUSTABLE MOE PERIODS.	CONTR	*Y,G,U	ND	B0	BYTE	31
NBFAIL	NUMBER OF BUS FAILURES	SECT	*Y,K,H,Q, KFMT	ND	B0	BYTE	1
NBICF	FLAGS SET WHEN NO BUS HAS YET ENTERED A ZONE DURING PRESENT CYCLE	ZONE	BC,BD	ND	NA	BIT	4
NC	NUMBER OF CONTROLLERS MINUS UNITY	SECT	*Y,W	ND	B0	BYTE	1
NCLM1	NUMBER OF CYCLE LENGTHS MINUS 1	NA	N	ND	B0	WORD	0
NCONTI	NUMBER OF CONTROLLER INTERVALS IN CORRESPONDING ADJUSTABLE MOE PERIOD. INDEX = ADJUSTABLE MOE PER. NO. + 6*(CONTROLLER NO.)	INDEX	*Y,G	ND	B0	BYTE	185
NCT	MAXIMUM POSSIBLE RAW CAR COUNT OF A NORMAL DETECTOR	NA	E	VEH	B0	WORD	1
NCWRD	NUMBER OF WORDS IN A CONTROLLER BIT ARRAY	NA	*Y,M	ND	B0	WORD	0
NCWRD2	TWICE THE NUMBER OF WORDS IN A CONTROLLER BIT ARRAY	NA	*Y,M	ND	B0	WORD	0
NCWRD64	64 TIMES THE NUMBER OF WORDS IN A CONTROLLER BIT ARRAY	NA	*Y,M	ND	B0	WORD	0
NDALNK	NUMBER OF DETECTORS ASSIGNED TO LINK INCLUDING DUMMIES.	LINK	*Y,E	ND	B0	BYTE	68

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
NDMAX	EQUATED TO NUMVED						
NDOL	NUMBER OF DETECTORS INSTRUMENTED ON LINK.	LINK	*Y,D,F,H, I,K	ND	B0	BYTE	68
NEXTPAGE	SET WHEN A REPORT TAKES MORE THAN A SINGLE PAGE	NA	H	ND	B0	WORD	1
NGC	CARS CLEARING LINK DURING NORMAL GREEN TIME	NA	BE	ND	B0	WORD	1
NHOLIDAY	NUMBER OF HOLIDAYS IN HOLIDTBL.	NA	*Y,I,Q	ND	B0	WORD	1
NI	NUMBER OF DETECTORS ON LINK BEING PROCESSED.	NA	*Y,E,F,H	ND	B0	WORD	1
NMANPAT	NUMBER OF MANUAL PATTERN NUMBERS IN EACH HISTORY BUFFER	NA	*Y,M	ND	B0	WORD	0
NOCONT	LIST OF NON-EXISTING CONTROLLERS.	NA	*K,H	ND	B0	BYTE	4
NOFAIL	NUMBER OF FAILURES IN FAILTB.	NA	*Y,K,H,M, KFMT,Q	ND	B0	WORD	1
NONCON$	NUMBER OF NON-EXISTING CONTROLLERS.	NA	*K,H	ND	B0	WORD	0
NOTINTOL	NUMBER OF LINKS THAT ARE NOT IN TOLERANCE	NA	H	ND	B0	WORD	1
NPATBYT	NRESPAT + NMANPAT	NA	*Y,M,W	ND	B0	WORD	0
NPATBYT4	4*NPATBYT	NA	*Y,W	ND	B0	WORD	0
NQL	NUMBER OF MULTI-DETECTOR LINKS	CONTR	*Y,K,V, BPS	ND	B0	BYTE	31
NREPORT	NUMBER OF 15 MINUTE REPORTS	NA	*H,I	ND	B0	WORD	1
NRESPAT	NUMBER OF TRAFFIC RESPONSIVE PATTERN NUMBERS IN EACH HISTORY BUFFER.	NA	*Y,M,W	ND	B0	WORD	0
NSACC	15 MINUTE ACCUMULATION OF NUMBER OF STOPS.	LINK	*Y,D,H	ND	B0	BYTE	68
NSDAY	ACCUMULATED STOPS IN A DAY.	LINK	*Y,H,I	VEH	B0	HALF	136
NSECTM1	NUMBER OF SECTIONS MINUS 1	NA	*Y,K,W	ND	B0	WORD	1
NSTOPS	SMOOTHED NUMBER OF STOPS PER CYCLE.	LINK	*Y,D,J,K	ND	B0	BYTE	68

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
NSUTC	START-UP TIME COUNTER 2-ACT,3-FAIL,4-REL	NA	*N	SEC	B1	WORD	1
NUM	TEMPORARY STORAGE	NA	BF,M,S	ND	NA	WORD	0
NUMBLK	NUMBER OF BPS ZONES	NA	*Y,J	ND	B0	WORD	1
NUMBPD	NUMBER OF BPS DETECTORS	NA	*Y,J,M	ND	B0	WORD	1
NUMCTL	MAXIMUM NUMBER OF CONTROLLERS IN SYSTEM	NA	*Y,D,H,I,J,K,M,BPS	ND	B0	WORD	1
NUMLNK	NUMBER OF LINKS.	NA	*Y,D,H,I,J	ND	B0	WORD	1
NUMMOV	SHUTDOWN/STARTUP TABLE CONTAINING THE NUMBER OF WORDS TO SAVE/RESTORE FOR THE ARRAYS LISTED IN MOVTAB	NA	*Y,Q	ND	B0	HALF	8
NUMSCT	NUMBER OF SECTIONS	NA	*Y,H,I,J,K,M,W	ND	B0	WORD	1
NUMVAR	NUMBER OF VARIABLE(ADJUSTABLE) INTERVALS IN A CONTROLLER CYCLE.	CONTR	*Y,K,S	ND	B0	BYTE	31
NUMVED	NUMBER OF VEHICLE DETECTORS	NA	*Y,B,E,H,J,K,M	ND	B0	WORD	1
NUMZONES	NUMBER OF ZONES ON A CONTROLLER	NA	H	ND	B0	WORD	1
N2	ZONE 2 CAPACITY CORRECTION FACTOR	LINK	*Y,C,D	VEH	B1	BYTE	68
OACC	15 MINUTE ACCUMULATION OF TOTAL LANE OCCUPANCY.	LINK	*Y,F,H	SEC	B5	HALF	136
ODAY	ACCUMULATED PERCENT OCCUPANCY IN A DAY.	LINK	*Y,H,I	PER	B2	HALF	136
ODD	DOWNSTREAM STOP AND THRU BUSES DETECTED	NA	BC	ND	NA	WORD	0
OFF	15 MINUTE PERIODS THAT BPSENB IS NOT SET	ZONE	*Y,H,I	ND	B0	BYTE	18
OPC	TEMPORARY STORAGE OF PERCENT OCCUPANCY.	NA	*Y,H,I	PER	B5	WORD	1
P	CORRECTED PULSE DURATION USED AS ARRAY INDEX	NA	C	ND	B0	WORD	0
PAGEKEY	SET WHEN A REPORT TAKES MORE THAN A SINGLE PAGE	NA	H	ND	B0	WORD	1

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
PAGNUM	PAGE NUMBER FOR .5 MINUTE AND END OF DAY REPORTS	NA	*H,I	ND	B0	WORD	1
PAR	LOCATION OF 1ST ENTRY IN SURVEILLANCE PARAMETER TABLE	NA	J	ND	NA	WORD	0
PARCOD	FLOW DATA PARAMETER CODE	NA	*Y,M,J	ND	B0	WORD	1
PATNUM	PRESENT PATTERN NUMBER.	SECT	*Y,H,K,W	ND	B0	BYTE	3
PCOT	TEMPORARY STORAGE OF LINK OCCUPANCY	NA	F	ND	B7	WORD	1
PDOF	POSSIBLE DETECTOR OBSTRUCTION FLAG	DET	E	ND	B0	BIT	32
PLENGTH	NUMBER OF WORDS IN VEHICLE DETECTOR ARRAYS.	NA	*A	ND	B0	WORD	1
PLS	PRESENT PULSE LENGTH OF DETECTOR BEING PROCESSED	NA	E	SEC	B5	WORD	0
PLT	PASSENGER LOADING TIME INDEXED BY 12*(ZONE NO.) + BLINDEX	INDEX	*Y,K,BPS	SEC	B0	BYTE	192
PLTDOW	DAY OF WEEK CODE USED FOR PLT INDEX 0 = WEEKDAY 1 = SATURDAY 2 = SUNDAY	NA	BC,BD,BE	ND	B0	WORD	1
PLTTOD	TIME OF DAY CODE USED FOR PLT INDEX 0 = END OF EVENING RUSH PERIOD TO BEGINNING OF MORNING RUSH PERIOD 1 = MORNING RUSH PERIOD 2 = END OF MORNING RUSH PERIOD TO BEGINNING OF EVENING RUSH PERIOD 3 = EVENING RUSH PERIOD	NA	BC,BD,BE	ND	B0	WORD	1
PMS	PASSENGER MINUTES SAVED FOR DAY	ZONE	*Y,H,I	MIN	B0	HALF	36
PMSTS	PASSENGER MINUTES SAVED (SECTION TOTAL)	NA	*H,I	ND	B0	WORD	1
PMSTT	PASSENGER MINUTES SAVED (SYSTEM TOTAL)	NA	*H,I	ND	B0	WORD	1
PRE	15 MINUTE PERIODS THAT PREMPFG IS SET	ZONE	*Y,H,I	ND	B0	BYTE	18

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
PREMPFG	FLAGS SET WHEN BPS EXTENSION IS INDEPENDENT OF ALGORITHM	ZONE	*Y,H,K,M, BPS	ND	B0	BIT	3
PRET	NUMBER OF INTERSECTIONS THAT ARE IN PRE-EMPT MODE	NA	H	ND	B0	WORD	1
PREVDATE	PREVIOUS DATE IN EBCDIC	NA	*I,H	ND	EBC-DIC	WORD	3
PRTFLG	15 MINUTE REPORT SUPPRESS FLAG. =0, PRINTOUT; =1, NO PRINTOUT.	NA	*M	ND	B0	WORD	1
PSGRGN	PASSENGER GAIN DURING THE PAST 15 MINUTES	ZONE	*Y,H,J	PASS-MIN	B0	HALF	36
PTN	PATTERN READ IN FROM RAD FOR PRESENT SECTION. SEE RTN W SPEC FOR FORMAT. (FIG. 2.24.2.2)	SEE DESCR	*Y,W	SEE DESCR	SEE DESCR	SEE DESCR	745
PW	CORRECTED PULSE DURATION USED IN SMOOTHING LOGIC	NA	C	SEC	B5	WORD	1
PWL	LOWER STOPS THRESHOLD. WHEN PW2 EXCEEDS PWL AND OTHER CRITERIA(SEE RTN D FLOW CHART) ARE PRESENT, PROBABILITY IS HIGH THAT STOPPED QUEUE EXTENDS BEYOND SECOND DETECTOR.	NA	*Y,D	SEC	B5	WORD	1
PWU	UPPER THRESHOLD FOR VEHICLE STOPS. WHEN PW2 OR PW3 EXCEEDS THIS THRESHOLD, PROBABILITY IS HIGH THAT LAST VEHICLE ACROSS DETECTOR HAS OR WILL STOP IMMEDIATELY DOWNSTREAM OF DETECTOR.	NA	*Y,D	SEC	B5	WORD	1
PW2	SMOOTHED PULSE WIDTH OF 2ND DETECTOR	LINK	*Y,C,D	SEC	B5	HALF	136
PW3	SMOOTHED PULSE WIDTH OF 3RD DETECTOR	LINK	*Y,C,D	SEC	B5	HALF	136
P1	VEHICLE DETECTOR ARRAY 1 EACH BIT REPRESENTS THE STATUS OF A PARTICULAR VEHICLE DETECTOR SIGNAL. A BIT-VALUE OF 0 = PRESENCE.	DET	*A,B,BPS	ND	B0	BIT *	64

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
P2	VEHICLE DETECTOR ARRAY 2 EACH BIT REPRESENTS THE STATUS OF A PARTICULAR VEHICLE DETECTOR SIGNAL. A BIT-VALUE OF 0 = PRESENCE.	DET	*A,B,BPS	ND	B0	BIT *	64
P3	VEHICLE DETECTOR ARRAY 3 EACH BIT REPRESENTS THE STATUS OF A PARTICULAR VEHICLE DETECTOR SIGNAL. A BIT-VALUE OF 0 = PRESENCE.	DET	*A,B,BPS	ND	B0	BIT *	64
P4	VEHICLE DETECTOR ARRAY 4 EACH BIT REPRESENTS THE STATUS OF A PARTICULAR VEHICLE DETECTOR SIGNAL. A BIT-VALUE OF 0 = PRESENCE.	DET	*A,B,BPS	ND	B0	BIT *	64
Q	TEMPORARY STORAGE FOR QUEUE	NA	D	VEH	B3	WORD	1
QACC	15 MINUTE ACCUMULATION OF QUEUE.	LINK	*Y,D,H	VEH	B3	BYTE	68
QBAR	SMOOTHED QUEUE.	LINK	*Y,D,J,K	VEH	B0	BYTE	68
QCIC	TEMPORARY STORAGE FOR QCICT VALUE	NA	D,V	VEH	B2	WORD	0
QCICT	SMOOTHED STOPPED QUEUE AT BEGINNING OF LINK GREEN	LINK	*Y,D,V	VEH	B2	BYTE	68
QCNT	TIMING COUNT FOR SCHEDULING RTN Q.	NA	*Q,A	SEC	B0	WORD	1
QCYCLE	COUNT OF THE NUMBER OF TIMES QUEUE HAS BEEN COMPUTED FOR A LINK	LINK	*Y,D,H	ND	B0	BYTE	68
QD	QUEUE DELAY	ZONE	BE	PASS-MIN	B0	WORD	1
QDAY	ACCUMULATED QUEUES PER CYCLE IN A DAY.	LINK	*Y,H,I	VEH	B5	HALF	136
QG	RAW QUEUES AT START OF GREEN PHASE.	LINK	*Y,D	VEH	B3	BYTE	68
QK	TEMPORARY STORAGE FOR QKABC1 VALUE	NA	V	VEH	B2	WORD	0

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
QKABC1	QKA1(BYTE 0), QKB1(BYTE 1) AND QKC1(BYTE 2) ARE THE NOMINAL EXPECTED VALUES OF STOPPED QUEUE AT THE BEGINNING OF LINK GREEN FOR LINKS A1, B1 AND C1, RESPECTIVELY, WHICH HAVE NOT GONE BEYOND SATURATION. BYTE 3 IS BLANK.	CONTR	*Y,V,W	VEH	B2 (EACH BYTE)	WORD	124
QKRRAB2	QKA2(BYTE 0) AND QKB2(BYTE 1) ARE THE NOMINAL EXPECTED VALUES OF STOPPED QUEUE AT BEGINNING OF LINK GREEN FOR LINK A2 AND B2, RESPECTIVELY, NOT YET BEYOND SATURATION. RRA2(BYTE 2) AND RRB2(BYTE 3) ARE THE EXPECTED VEHICLE RELEASE RATE THROUGH A DOWN-STREAM INTERSECTION FOR LINKS A2 AND B2, RESPECTIVELY.	CONTR	*Y,D,V,W	VEH AND SEC/ VEH	B2 (EACH BYTE)	WORD	124
QM	NUMBER OF VEHICLES IN QUEUE	TTSA	C	VEH	B2	WORD	0
QMAST	PRIORITY OF RTN Q IN MAST	NA	*Y,A,I, L,Q,W	ND	B0	WORD	1
QPT	TEMPORARY STORAGE OF QUEUE PER CYCLE.	NA	*Y,H,I	VEH	B5	WORD	1
QR	TEMPORARY STORAGE OF RAW QUEUE AT START OF RED	NA	D	VEH	B3	WORD	1
QRD	RAW QUEUE AT START OF RED.	LINK	*Y,D	VEH	B0	BYTE	68
QVOK	FLAGS INDICATING FAILURE STATUS. CODE IS '0' WHEN-EVER ANY COMPONENT ON LINK HAS FAILED;'1' FOR ONE FULL ACTION PERIOD(FULL GREEN OR RED PERIOD) FOLLOWING CORR-ECTION OF FAILURE;'2' THERE-AFTER.	LINK	*Y,D,M,V	ND	B0	BYTE	68
Q1	SMOOTHED QUEUE IN ZONE	LINK	*Y,C,D	VEH	B3	BYTE	68
RAWLNKC	RAW LINK COUNT. TOTAL COUNT PER CYCLE OF ALL DET-ECTORS ON LINK BEING PRO-CESSED.	NA	*Y,E,F	VEH	B0	WORD	1
RAWLNKO	RAW LINK OCCUPANCY. TOTAL ACCUMULATION PER CYCLE OF RAW OCCUPANCY OF ALL DET-ECTORS ON LINK BEING PRO-CESSED.	NA	*Y,E,F	SEC	B1	WORD	1

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
RAWOCC	RAW OCCUPANCY	DET	*Y,C,E	SEC	B5	HALF	258
RAWSP	RAW SPEED	DET	*Y,C,E	/SEC	B4	HALF	258
RC15	NUMBER OF TIMES ZCCY HAS BEEN RESET OVER EACH 15 MINUTE PERIOD	ZONE	BC	ND	B0	BYTE	32
REGA	BCD CONTROL PANEL THUMBWHEEL INPUT	NA	M	ND	NA	WORD	0
REGB	BINARY EVALUATION OF REGA	NA	M	ND	B0	WORD	0
RR	TEMPORARY STORAGE FOR RRABC1 AND QKRRAB2 VALUES	NA	D,V	SEC/ VEH	B2	WORD	0
RRABC1	RRA1(BYTE 0), RRA2(BYTE 1), AND RRC1(BYTE 2) ARE THE EXPECTED VEHICLE RELEASE RATE THROUGH A DOWNSTREAM INTERSECTION FOR LINKS A1, B1 AND C1, RESPECTIVELY.	CONTR	*Y,D,V,W	SEC/ VEH	B2 (EACH BYTE)	WORD	124
RTC	REAL TIME CLOCK	NA	*Y,A,B,M, BPS	SEC	B5	WORD	1
R0,R1,.. ....,R15	GENERAL REGISTERS USED FOR TEMPORARY STORAGE	NA	ALL	ND	NA	WORD	0
S	PAR FORMAT FLAG (=0 IF PAR IS A HALFWORD ARRAY; =1 IF PAR IS A BYTE ARRAY).	NA	J	ND	NA	BIT	0
SACC	15 MINUTE ACCUMULATION OF SPEED.	LINK	*Y,F,H	/SEC	B4	HALF	136
SAVIND	USED TO SAVE INTERNAL INDEX DURING PAGE PRINTOUT	NA	H	ND	B0	WORD	1
SB	STOP BUS VOLUME FOR DAY	ZONE	*Y,H,I	BUSES	B0	HALF	36
SBAR	SMOOTHED LINK SPEEDS.	LINK	*Y,F,J,K	MPH	B2	BYTE	68
SBCCLK	STOP BUS CLEARANCE CLOCKS	ZONE	BC,BD	SEC	B1	BYTE	32
SBI	STOP BUS INDICATOR ARRAY. EACH BIT REPRESENTS THE STATUS OF A PARTICULAR STOP BUS INDICATOR SIGNAL A BIT-VALUE OF 0 = PRESENCE.	BUS DET	*Y,BPS	ND	B0	BIT *	8
SBTS	STOP-BUS TOTAL FOR SECTION	NA	*H,I	BUSES	B0	WORD	1
SBTT	STOP-BUS TOTAL FOR SYSTEM	NA	*H,I	BUSES	B0	WORD	1
SBV15	15 MINUTE STOP BUS VOLUME	ZONE	*Y,H,K, BPS	BUSES	B0	BYTE	32
SCTZON	SECTION-TO-ZONE TABLE.	NA	*H,I	ND	B0	BYTE	18

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
SDAY	ACCUMULATED AVERAGE SPEED IN A DAY.	LINK	*Y,H,I	MPH	B3	HALF	136
SECCFC	SECTION-CONTROLLER FAILURE TABLE. NUMBER OF FAILED CONTROLLERS IN EACH SECTION.	SECT	*Y,H,K,M, KFMT,Q	ND	B0	WORD	4
SECCONSI	1ST CONTROLLER INDEX NUMBER FOR SECTION IN SECCONT	SECT	*Y,H,M,W	ND	B0	BYTE	2
SECCONT	CONTROLLER NUMBERS FOR EACH SECTION POINTED TO BY SECCONSI	SECC-ONSI	*Y,H,M,W	ND	B0	BYTE	28
SECDFC	SECTION-DETECTOR FAILURE TABLE. NUMBER OF FAILED DETECTORS IN EACH SECTION.	SECT	*Y,H,K,M, KFMT,Q	ND	B0	WORD	4
SECTLKN	LINK NUMBERS FOR EACH SECTION POINTED TO BY LINKSI	LINK-SI	*Y,I,W	ND	B0	HALF	136
SECTTLS	SECTION TOTALS FLAG USED TO INDICATE SECTION PRINTOUT WAS PERFORMED (FLAG=1) OR SYSTEM PRINTOUT WAS PERFORMED (FLAG=0)	NA	*H,I	ND	B0	WORD	1
SEMMSK	SEMI-ACTUATED CONTROLLER MASK ARRAY. BIT VALUE OF 0 INDICATES A SEMI.	CONTR	*Y,A1,M,T, X		B0	BIT *	4
SGC	CARS CLEARING LINK DURING EXTENDED GREEN TIME	NA	BE	ND	B0	WORD	1
SHTFLG	SHUTDOWN FLAG.	NA	*Y,A,H,I, L,M,W	ND	B0	WORD	1
SI	FIRST GOING GREEN ZONE INDEX FOR ZNIN ARRAY	ZNIN-SI	BD	ND	B0	WORD	0
SLFDPN	STARTING LOCATION FOR DESIRED PATTERN NUMBER. RAD STARTING POINT TO READ IN PATTERN. INDEX = (NUMBER OF STORAGE WORDS)*(PATTERN NO.) + (SECTION NO.)	INDEX	*Y,W	ND	B0	WORD	11
SLIM	FIRST GOING GREEN ZONE INDEX (SI) LIMIT	ZNIN-SI	BD	ND	B0	WORD	0
SPLCHG	SPLIT CHANGE FLAGS	CONTR	*Y,M,R,T	ND	B0	BIT *	4
SSFW	SINGLE SECTION FOR RTN W	NA	*Y,M	ND	B0	WORD	1
ST	TEMPORARY STORAGE FOR LINK SPEED	NA	F	MPH	B2	WORD	0
STARTA	START OF A-PHASE GREEN	CONTR	*O,R,T	ND	B0	BIT *	8
STARTUPF	FLAG SET WHEN 125 SEC HAVE ELAPSED SINCE RTN N WAS 1ST ENTERED	NA	A1,N,Y, BPS	ND	B0	WORD	1

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
STATE	STATE OF CRT FROM RBM	NA	*RBM, CRTOUT	ND	B0	WORD	1
STBTIM	STANDBY TIME	CONTR	*Y,R	SEC	B1	BYTE	32
STBYD	STANDBY DESIRED FLAG	CONTR	*Y,M,Q,R, X	ND	B0	BIT *	4
STFLG2	FLAGS SET AT PREDICTED GREEN. RESET AT STOPS THRESHOLD TIME FOR ZONE 1.	LINK	*Y,C,D	ND	B0	BIT	9
STFLG3	FLAGS SET AFTER PREDICTED GREEN WHEN THE TOTAL NO. OF CARS IN ZONES 0,1 AND 2 EXCEEDS THE CAPACITY OF ZONES 0 AND 1. RESET AT STOPS THRESHOLD TIME FOR ZONE 2.	LINK	*Y,C,D, BPS	ND	B0	BIT	9
STFLG4	FLAGS SET AT PREDICTED RED. RESET AT PREDICTED GREEN.	LINK	*Y,C,D	ND	B0	BIT	9
STFLG5	FLAGS USED IN BPS ALGOR. SET AFTER STOPS THRESHOLD TIME FOR ZONE 1, IF ACTUAL GREEN HAS OCCURRED.	LINK	*Y,C,D	ND	B0	BIT	9
STOP1	PREDICTED STOPS THRESHOLD TIMES FOR VEHICLES ENTERING ZONE 1.	LINK	*Y,C,D	ND	B1	HALF	136
STOP2	PREDICTED STOPS THRESHOLD TIMES FOR VEHICLES ENTERING ZONE 2.	LINK	*Y,C,D	ND	B1	HALF	136
STPTEMP	TEMPORATY STORAGE OF STOPS.	NA	*Y,H	VEH	B0	WORD	1
SUMA	TEMPORARY STORAGE FOR SUMABCT VALUE	NA	M,V	SEC	B1	WORD	0
SUMABCT	SUMA(BYTE 0), SUMB(BYTE 1) AND SUMC(BYTE 2) ARE THE SUMMATIONS OF ALL FIXED INTERVALS WHICH ARE PART OF A-PHASE, B-PHASE AND C-PHASE GREEN, RESPECTIVELY. SUM-TOTAL(BYTE 3) IS A SUMMATION OF ALL FIXED INTERVALS AND THE MINIMUM DURATION OF ALL ADJUSTABLE INTERVALS IN A CONTROLLER CYCLE WHICH ARE NOT PART OF A-PHASE, B-PHASE OR C-PHASE GREEN.	CONTR	*Y,K,M,S, V,W	SEC	B1 (EACH BYTE)	WORD	124

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
SUMB	TEMPORARY STORAGE FOR SUMABCT VALUE	NA	M,V	SEC	B1	WORD	0
SUMC	TEMPORARY STORAGE FOR SUMABCT VALUE	NA	V	SEC	B1	WORD	0
SURDIS	SURVEILLANCE DISPLAY CODE	NA	*Y,M,J	ND	B0	WORD	1
SYSFLG	FLAG SET TO 1 INDICATE ARRAY DATA UPDATE. SET TO 0 TO INDICATE SINGLE WORD UPDATE.	NA	M	ND	B0	WORD	0
SZSI	STARTING INDEX FOR SCTZON.	NA	*H,I	ND	B0	BYTE	2
TAMODE	ACTUAL MODE COLUMN OF SYSTEM STATUS REPORT	NA	H	ND	B0	WORD	0
TB·	THRU BUS VOLUME FOR DAY	ZONE	*Y,H,I	BUSES	B0	HALF	36
TBCCLK	THRU BUS CLEARANCE CLOCKS	ZONE	BC,BD	SEC	B1	BYTE	32
TBD	TRUNCATED BUS DELAY	ZONE	BE	PASS MIN	B0	WORD	1
TBI	THRU BUS INDICATOR ARRAY. EACH BIT REPRESENTS THE STATUS OF A PARTICULAR THRU BUS INDICATOR SIGNAL A BIT-VALUE OF 0 = PRESENCE.	BUS DET	*Y,BPS	ND	B0	BIT *	8
TBTS	THRU-BUS TOTAL FOR SECTION	NA	*H,I	BUSES	B0	WORD	1
TBTT	THRU-BUS TOTAL FOR SYSTEM	NA	*H,I	BUSES	B0	WORD	1
TBV15	15 MINUTE THRU BUS VOLUME	ZONE	*Y,H,K, BPS	BUSES	B0	BYTE	32
TCD	TRUNCATED CAR DELAY	ZONE	BE	PASS MIN	B0	WORD	1
TCFAIL	CONTROLLER FAILURES COLUMN OF SYSTEM STATUS REPORT	NA	H	ND	B0	WORD	0
TCK1	TIME FROM START OF CYCLE	CYCLC	S,U	SEC	B1	WORD	0
TCODE	TYPE COLUMN OF FAILURE STATUS REPORT	NA	H	ND	B0	WORD	0
TD	PULSE DURATION CORRECTION FACTOR	NA	C	SEC	B5	WORD	1
TDIFF	TEMPORARY STORAGE USED IN STOP TIMES' CALCULATIONS	NA	C	NA	NA	WORD	0
TDMODE	DESIRED MODE COLUMN OF SYSTEM STATUS REPORT	NA	H	ND	B0	WORD	0
TEMP	ABSOLUTE VALUE OF THE DIFFERENCE BETWEEN TVPLUSKO AND MVPLUSKO	NA	H	VPH	B0	WORD	0

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
TEMPCSF	FLAGS SET FOR EACH CYCLE WHICH HAS STARTED BEFORE ROUTINE E IS ENTERED.	CYCLC	E	ND	B0	BIT	0
TEMPMOEF	FLAG SET WHEN LINK BEING PROCESSED HAS AN INOPERATIVE DETECTOR	NA	E	ND	B0	BIT	1
TEMPQ	TEMPORARY STORAGE USED IN STOP TIMES' CALCULATIONS	NA	C	NA	NA	WORD	0
TEMPS	TEMPORARY STORAGE OF NUMBER OF STOPS	NA	D	VEH	B1	WORD	0
TEMPZ	TEMPORARY STORAGE OF ZONE COUNTS	NA	D	VEH	B1	WORD	0
TESTNN	TEMPORARY STORAGE FOR TEST PATTERN	NA	W	ND	NA	WORD	0
TESTNOW	TEST CHECK PATTERN	NA	W	ND	NA	WORD	0
TEW	WORKING (MAXIMUM) BUS EXTENSIONS	LINK	*Y,D,K,M, W,BPS	SEC	B1	BYTE	68
TEWCT	BUS EXTENSION VALUE FOR	CONTR	*Y,D,K,T,	SEC	B1	BYTE	31
TEWM	MAXIMUM BUS EXTENSIONS.	LINK	*Y,M,W	SEC	B1	BYTE	68
TFAIL	DETECTOR FAILURES COLUMN OF SYSTEM STATUS REPORT	NA	H	ND	B0	WORD	0
THRESH-OLD	VALUE ASSIGNED DEPENDING ON CONTROL PANEL SETTINGS	NA	J,M	ND	B0	WORD	0
THB	TOTAL NUMBER OF BUSES HELPED ON INTERSECTION	NA	BE	ND	B0	WORD	0
THRESH	FLOW DATA THRESHOLD	NA	*Y,M,J	ND	B0	WORD	1
TIME	TIME COLUMN OF FAILURE STATUS REPORT	NA	H	ND	B0	WORD	0
TIMEOUT	TIMING CELL	CONTR	*Y,P	SEC	B1	BYTE	32
TIMMCH	TIME OF MODE CHANGE. HALFWORD '0' CONTAINS HRS HALFWORD '1' CONTAINS MIN.	SECT	*Y,H,K,M	HRS-MIN	NA	WORD	4
TK	EQUALS KCL		D,M				
TKM	MINIMUM CYCLE LENGTH	CONTR	*Y,S,W	SEC	B1	BYTE	31
TLENGTH	LENGTH OF TSTART ARRAY. EQU	NA	*Y	ND	B0	WORD	0

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
TLIM	BUS DETECTOR PRESENSE TIME LIMIT OVER WHICH THE BPS DETECTOR FLAG IS SET	NA	BC	SEC	B5	WORD	0
TMDY	TIME,MONTH,DAY,YEAR	NA	*Y,BPS	ND	EBC-DIC	WORD	4
TM1	TIME OF PRESENT EXCESSIVE BUS COUNT	ZONE	BC	SEC	B1	WORD	128
TM1R	TIME OF PRESENT EXCESSIVE RESET COUNT	ZONE	BC	SEC	B1 -	WORD	128
TODC	TIME OF DAY COUNT	NA	*Y	ND	B0	WORD	1
TOSU	FIRST TIME RTN H WAS ENTERED.	NA	*I,H	HRS: MIN	EBC-DIC	WORD	1
TP	TEMPORARY STORAGE USED IN CAR COUNT CALCULATIONS	NA	C	VEH	B3	WORD	0
TPAT	PATTERN NUMBER COLUMN OF SYSTEM STATUS REPORT	NA	H	ND	B0	WORD	0
TRANSF	TRANSITION FLAGS. SET IN RTN W WHEN A CHANGE IN PATTERN IS TO BE INITIATED. RESET IN RTN T.	CONTR	*Y,D,K,M, P,R,T,W, X	ND	B0	BIT *	4
TRDLY	TRAFFIC RESPONSIVE DELAY FLAG. SET WHEN 15 MINUTES OF DATA HAS NOT BEEN ACCUM-ULATED.	SECT	*Y,W	ND	B0	BIT	1
TRTM	TRAVEL TIME	NA	H	SEC	B4	WORD	1
TSECT	SECTION NUMBER	NA	H	ND	B0	WORD	0
TST	TEMPORARY STORAGE FOR GMINABC4 VALUE	NA	S	SEC	B1	WORD	0
TSTART	PULSE STARTING OR ENDING TIMES. SIGN IS NEGATIVE AFTER START OF PULSE AND IS POSITIVE AFTER END OF PULSE.	DET	*Y,B,E,M	SEC	B5	WORD	516
TT	PULSE DURATION (PRESENCE)	NA	*Y,B,C	SEC	B5	WORD	1
TTC	CORRECTED PULSE DURATION	NA	C	SEC	B5	WORD	1
TTIME	TIME	NA	H	ND	B0	WORD	0
TTSA	TIME TO STOP ARRAY. NUMBER OF VEHICLES IN A QUEUE(QM).	PULSE LENGTH AND TTSASI	*Y,C	VEH	B2	BYTE	48

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
TTSASI	STARTING INDEX FOR TTSA. LIST FREE FLOW SPEED INDEX (0,1,2)	LINK	*Y,C	ND	B0	BYTE	68
TT3	MAXIMUM EXPECTED PULSE DUR- ATION FOR OPERATING VEHICLES.	NA	*Y,E	SEC	B5	WORD	1
TT7	MAXIMUM PULSE RESET TIME IN A NORMALLY OPERATING DETECT.	NA	*Y,E	SEC	B5	WORD	1
TVPLUSKO	HISTORY VOLUME PLUS WEIGHTED OCCUPANCY	NA	H	VPH	B0	WORD	1
VACC	15 MINUTE ACCUMULATION OF VEHICLE COUNTS.	LINK	*Y,F,H	VEH	B0	HALF	136
VARINT	VARIABLE INTERVAL NUMBERS INDEX = 4*(CONTROLLER NO.) + (VARIABLE INTERVAL NO.)	INDEX	*Y,K,S,T, V	ND	B0	BYTE	123
VDAY	ACCUMULATED DAILY VOLUME	LINK	*Y,H,I	VEH	B0	HALF	136
VHIST	HISTORY VALUE OF VOLUME.	LINK	*Y,E,F,H, W	VEH/ HR	B1	HALF	136
VO	TEMPORARY STORAGE FOR VOT VALUE	NA	D,V	VEH	B2	WORD	0
VOL	SMOOTHED VEHICLE VOLUMES	LINK	*Y,D,F,H, J,V,W	VEH/ HOUR	B1	HALF	136
VOT	SMOOTHED NUMBER OF VEHICLES HAVING EXITED FROM A LINK AT DOWNSTREAM INTERSECTION DURING A CONTROLLER CYCLE.	LINK	*Y,D,V	VEH/ CYC	B2	BYTE	68
VPHT	TEMPORARY STORAGE OF LINK VOLUME	NA	F	VEH/ HR	B1	WORD	0
VPLUSKO	HISTORY VALUE OF VOLUME PLUS WEIGHTED OCCUPANCY SUBSET OF HSBUF ARRAY.	NA	*Y,M,W	VEH/ HR	B3	BYTE	0
W	TEMPORARY STORAGE USED AS DETECTOR CHANGE-OF-STATE	NA	B	ND	NA	BIT	0
WD9	CONSTANT (9) USED TO CONVERT QACC TO PERCENT	NA	H	ND	B0	WORD	1
	CONSTANT (900) USED TO CONVERT QACC TO 15-MINUTE AVERAGE	NA	H	ND	B0	WORD	1
WHSF	ONE-HALF SECOND FLAG.	NA	*Y,A	ND	B0	WORD	1
WHSFB	ONE-HALF SECOND BPS FLAG	NA	*A,BPS	ND	B0	WORD	1

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
WMAST	PRIORITY OF RTN W IN MAST.	NA	*Y,A,H,M, W	ND	B0	WORD	1
WMINF	ONE MINUTE FLAG	NA	*A,L,BPS	ND	B0	WORD	1
WRKOFF	WORKING OFFSET	CONTR	*Y,M,S,T, U,W,X	SEC	B1	BYTE	31
WSBF	ONE SECOND BPS FLAG.	NA	*Y,A,BPS	ND	B0	WORD	1
WSF	ONE SECOND FLAG	NA	*Y,A,D	ND	B0	WORD	1
YIELD	LABEL EQUATED TO IADVP	CONTR	X	ND	B0	BIT *	0
ZCCY	COUNT OF BUSES IN EACH ZONE	ZONE	BC,BD,BE	ND	B0	BYTE	32
ZD0	CAR COUNT IN UTCS ZONE 0	LINK	*Y,C,D BPS	VEH	B3	BYTE	68
ZD1	CAR COUNT IN UTCS ZONE 1	LINK	*Y,C,D, BPS	VEH	B3	BYTE	68
ZD2	CAR COUNT IN UTCS ZONE 2	LINK	*Y,C,D	VEH	B3	BYTE	68
ZF2	ESTIMATE OF QUEUE EXTENDED BEYOND 2ND DETECTOR FOR 2 OR 3 DETECTOR LINKS, WHERE QUEUE HAS NOT YET REACHED 3RD DETECTOR.	LINK	*Y,D	VEH	B1	BYTE	68
ZF3	ESTIMATE OF QUEYE EXTENDED BEYOND 3RD DETECTOR FOR 3 DETECTOR LINKS, WHERE STOPPED QUEUE HAS REACHED 3RD DETECTOR.	LINK	*Y,D	VEH	B1	BYTE	68
ZI	ZONE INDEX FOR CONTZN ARRAY	ZSI	BD	ND	B0	WORD	0
ZLIM	UPPPER LIMIT OF ZONE INDEX FOR SECTION	NA	H	ND	B0	WORD	0
ZNIN	ARRAY LISTING ALL ZONES ARRANGED BY THE MOE PERIOD AT THE END OF WHICH THEY GO GREEN	ZONE	BD	ND	B0	BYTE	18
ZNINSI	ARRAY GIVING LOCATION OF FIRST GOING GREEN ZONE IN ZNIN ARRAY	MOE PER.	BD	ND	B0	BYTE	13
ZOLD1	ZONE 0 + ZONE 1 COUNTS UP TO STOPS THRESHOLD TIME.	LINK	*Y,C,D	VEH	B3	BYTE	68
ZOLD2	ZONE 0 + ZONE 1 + ZONE 2 COUNTS UP TO STOPS THRESHOLD TIME.	LINK	*Y,C,D	VEH	B3	BYTE	68

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

SYMBOL	DESCRIPTION	ARRAY INDEX	REFERENCE ROUTINES	UNITS	SCALE	FORMAT	STORAGE (WORDS)
ZONELNK	CONVERTS BPS ZONE NUMBERS TO UTCS LINK NUMBERS	ZONE	*Y,H,K,M, KFMT,BPS	ND	B0	HALF	36
ZONEMODE	15-MINUTE OPERATING MODE CODE	ZONE	H	ND	B0	BYTE	20
ZONENUM	TEMPORARY STORAGE FOR REGB	NA	M	ND	B0	WORD	0
ZONEPTR	CONTAINS THE NEXT ZONE TO BE PROCESSED WHEN RTNH RELEASES CONTROL TO PRINTOUT A PAGE OF THE ZONE SUMMARY REPORT.	NA	H*,I	ND	B0	WORD	1
ZSI	1ST ZONE INDEX NUMBER FOR EACH CONTROLLER IN CONTZN	CONTR	*Y,H,K,M, BPS	ND	B0	BYTE	32
ZSLIM	ZONE INDEX LIMIT FOR ZI	ZSI	BD	ND	B0	WORD	0
Z2	AVERAGE NUMBER OF STOPPED VEHICLES BETWEEN 2ND AND 3RD DETECTORS WHEN QUEUE HAS EXTENDED UP TO AND BEYOND 3RD DETECTOR.	NA	D	VEH	B1	WORD	0
1MINCT	ONE MINUTE COUNT	NA	A	SEC	B5	WORD	1
1TBUFF	TAPE BUFFER 1	NA	BPS	ND	NA	WORD	925
2NCWRD	TWICE THE NUMBER OF WORDS IN A CONTROLLER BIT ARRAY MINUS 2	NA	*Y,A1,O	ND	B0	WORD	0
2TBUFF	TAPE BUFFER 2	NA	BPS	ND	NA	WORD	925
15MINCYC	TIME ELAPSED IN CURRENT 15 MINUTE PERIOD.	NA	*A,K	SEC	B0	WORD	1
15TBSIZE	NUMBER OF WORDS IN THE 15 MINUTE TAPE BUFFER	NA	*Y,H	ND	B0	WORD	0
15TBUFF	15-MINUTE MOE TAPE BUFFER FOR UNITS AND SCALING SEE RTNH SPEC.	15T-INDEX	*Y,H	ND	NA	HALF	1157
15TBYTE	NUMBER OF BYTES IN THE 15 MINUTE TAPE BUFFER	NA	*Y,H	ND	B0	WORD	0
15TINDEX	15-MINUTE MOVE TAPE BUFFER INDEX	NA	H	ND	B0	WORD	1
15ZMODE	ARRAY OF 15-MINUTE OPERATING MODES FORMATTED FOR LINE PRINTER. 3-INH,1-PRE,	ZONE-MODE	H	ND	B0	WORD	5

FIGURE 3.0.1 UTCS/BPS GLOSSARY (Continued)

4. Appendices

This section contains appendices describing procedures for updating a compressed deck, for making manual corrections using the CPU 2 panel, for creating a save tape, for dumping a file, for loading a pattern and for using the FORTRAN callable subroutines. This section also contains appendices composed of the UTCS traffic algorithms, the bus intersection gain algorithm, a Source Edit Routine and a list of references.

4.1 Updating a Compressed Deck

The use of the CO option of the MACRSYM card directs Macro-Symbol to produce a compressed deck from a source program, which can then be used as input during a later assembly. Because compressed decks contain one-fourth to one-fifth as many cards as the source deck, they are significantly more manageable and faster to handle.

Compressed decks can be updated via an "update packet", which is the set of cards between the first + (update) command and the compressed deck. If any symbclic cards (a "symbolic deck") precede the first + command, they are treated as if they were preceded by an a +0 card (see +k below); that is, they are inserted before the first line of the program.

Macro-Symbol recognizes three update control commands:

+k where k is a line number corresponding to a line on the source or assembly listing produced from the compressed deck. The +k control card designates that all cards following the +k card, up to but not including the next update control card, are to be inserted after the kth line of the source program. The command +0 designates an insertion before the first line of the program.

+j,k where j and k are line numbers corresponding to line numbers on the source or assembly listing produced from the compressed deck, and j is less than or equal to k. This form designates that all cards following the +j,k card, up to but not including the next update control card, are to replace lines j through k of the source program. The number of lines to be inserted does not have to equal the number of lines removed; in fact, the number of lines to be inserted may be zero. In this case, lines j through k are deleted.

+END where END designates the physical end of an update packet. If the SI and CI devices are the same, this command is optional, since Macro-Symbol

terminates the update packet automatically on encountering the first compressed card. If the SI and CI devices are different, this command is necessary.

The + character of each update control command must be in column 1, followed immediately by the control information, with no embedded blanks. The first blank column terminates the control command, and comments may optionally follow the blank. The update control commands, with their associated update records, must occur in numeric sequence.

The ranges of successive insert and/or delete control commands must not overlap, except that the following case is permissible: +j, k followed by +k, where j < k. Overlapping control commands cause an abort error.

As an example, consider the partial listing of Routine L (Figure 4.1.1) with the following modifications required:

a) The second element of the Stored Answers (STANS) array is to be moved to the end of the array.

b) A new element, having the value of 6, is to be added as the last element of the expanded STANS array.

c) The first operation performed by Routine L is to be a 'Store-doubleword' instruction.

The update packet to accomplish these changes would appear as:

```
+29,29
+39
                    DATA        X'FFFFC19C'
                    DATA        X'00000006'
+48,48
                    STD, 0      TEMRI
+END
```

ASSEMBLY UPDATES IN BATCH MODE

When batch assemblies consist of successive update packets from card input to compressed decks on the RAD or magnetic tape, the update packets are terminated by +END cards.

There must be a one-to-one correspondence between update packets and compressed programs. For example, three compressed decks on magnetic tape would require three update packets so that each compressed deck would receive its update in correct

```
200   16:46  AUG 02, '72                    ***** RTNL L  COMPUTER EVALUATION *****                    2
      2                                     DEF     RTNL,RTNBJ,CPFLG,BPSDOWN
      3                                      REF     SHTFLG
      4                                     REF     QMAST,KMAST,CRTFL1,CRTFL2,CRTDC1,CRTDC2
      5                                      REF     LMAST,MAST,CPANOUT,BPSYSIF,WMINF,MASK                    RTNL
      6                                     SYSTEM  UTCSREG
      7   01 00000                  ARADD   RES     1               * ADD OF INPUT DATA CPU-1
      8   01 00001                  ARADD2  RES     1               * ADD OF INPUT DATA CPU-2
      9                                     BOUND   8
     10   01 00002                  EXVA1   RES     12              * RESULT OF CPU-1 CALCULATION
     11   01 0000E                  EXVA2   RES     12              * RESULT OF CPU-2 CALCULATION
     12   01 0001A                  INPUT   RES     8               * VARIABLE INPUT ARRAY
     13                             *                               * ARRAY OF STORED DATA
     14   01 00022  00000001 A      STDATA  DATA    1
     15   01 00023  00000002 A              DATA    2
     16   01 00024  00000003 A              DATA    3
     17   01 00025  00000004 A              DATA    4
     18   01 00026  00000005 A              DATA    5
     19   01 00027  00000006 A              DATA    6
     20   01 00028  00000007 A              DATA    7
     21   01 00029  00000008 A              DATA    8
     22   01 0002A  00000000 A      CPFLG   DATA    0               * COMPARISON FLAG
     23   01 0002B  00000000 A      FLAG    DATA    0               * ENTRY FLAG FOR L1
     24   01 0002C  00000000 A      FLAG2   DATA    0               * ENTRY FLAG FOR BJ
     25   01 0002D  00000000 A      BPSDOWN DATA    0                       *SHT DOWN BPS FLAG               RTNL
     26                             *                               * ARRAY OF STORED ANS
     27                                     BOUND   8                                                        RTNL
     28   01 0002E  FFFFFFFF A      STANS   DATA    X'FFFFFFFF'
     29   01 0002F  FFFFC19C A              DATA    X'FFFFC19C'
     30   01 00030  00000702 A              DATA    X'00000702'
     31   01 00031  FFFFC194 A              DATA    X'FFFFC194'
     32   01 00032  00000016 A              DATA    X'00000016'
     33   01 00033  00000001 A              DATA    X'00000001'
     34   01 00034  00000404 A              DATA    X'00000404'
     35   01 00035  00000200 A              DATA    X'00000200'
     36   01 00036  00000003 A              DATA    X'00000003'
     37   01 00037  0000000A A              DATA    X'0000000A'
     38   01 00038  00000705 A              DATA    X'00000705'
     39   01 00039  00000002 A              DATA    X'00000002'
     40   01 0003A  00000005 A      BEGIN   DATA    5
     41                             *                               * TEMPORARY STORAGE
     42   01 0003B                  TEMR    RES     1
     43   01 0003C                  TEMR1   RES     1                       *                                RTNL
     44   01 0003D                  TEMR2   RES     1                       *                                RTNL
     45   01 0003E                  TEMR3   RES     1                       *                                RTNL
     46                             *       ENTRY WHEN CPU1 AND CPU2 OPERATIONAL
     47   01 0003F                  RTNL    RES     0               *       *                                RTNL
     48   01 0003F  3500003C                STW,0   TEMR1                   SAVE EXIT FOR RTNL2 OR SHUTDOWN
     49   01 00040  3300002A                MTW,0   CPFLG                   *TST MODE OF OPERATION           RTNL
     50   01 00041  60300053                BNEZ    RTNL2                   *NO CPU 2, USED STR DATA         RTNL
     51   01 00042  2260000C A             LI,R6   12
```

Figure 4.1.1 Partial Listing of Routine L

sequence. If only two of the compressed decks were to be updated (i.e., decks 1 and 3), the sequence integrity would be maintained by placing two +END cards after update packet 1. When the assembler reads the second +END card, it would update compressed deck 2 with an "empty" update packet and then update compressed deck 3 with update packet 3. At the conclusion of each update, the new (updated) version is written on the CO device.

Further details regarding these operations as well as terminology explanations are contained in: XEROX Sigma 5/7 Macro-Symbol and Real-Time Batch Monitor (RBM) reference manuals. See Section 4.10.

4.2 Manual Correction Procedure Using CPU 2 Control Panel

1. Set address of location to be examined/changed using the SELECT ADDRESS switches.

2. Actuate momentary DISPLAY toggle switch to the SELECT ADDR (down) position, and release to neutral (center). Current contents of the selected address can now be inspected in the DISPLAY light bank.

3. If contents of the location are to be modified:

   a) Define new bit configuration of the entire memory word using the DATA switches.

   b) Actuate momentary DATA toggle switch to CLEAR (up) position and then down to ENTER. The redefined configuration should now be indicated in the DISPLAY light bank.

   c) Actuate momentary STORE toggle switch to the SELECT ADDR (down) position and return to neutral.

- Note that if a CPU 1 address is desired, X'4000' must be added to the CPU 2 address if the CPU 1 address is between X'000' and X'3FFF'; X'4000' must be subtracted from the CPU 2 address if the CPU 1 address is between X'4000' and X'7FFF'. For all other CPU 1 addresses, the CPU 2 address is the same.

4.3 Procedure for Creating a Save Tape

A save tape of the entire software stored on the RAD may be created by mounting the magnetic tape (RING-IN) on tape drive 7TAE0. Next, input the following commands on the CPU1 TTY:

```
Key-In:   "TYC"
Type-In:  !JOB 1,SAVTP
          !RADEDIT
          :SAVE ALL
          !FIN
Key-In:   "CC"
```

4.4 Procedure for Dumping a File From the RAD To The Line Printer

A file may be dumped by the following procedure.

Key-In: "RLS KING" (if in the foreground mode)

Key-In: "TYC"

Type-In: !JOB

!RADEDIT

:DUM Δ(FIL, D4, File Name)

!FIN

4.5 Procedure for Loading a Pattern

A FORTRAN Pattern Program is available for loading patterns on the RAD. A sample case using this program was supplied (Figure 4.5.1) with input card data for three of the existing Time of Day (TOD) street implementations.

The FORTRAN Pattern Program must be run as a background job. If the system is operating in the foreground traffic mode, the system can be placed in the background mode by the key-in "RLS KING", on the CPU 1 TTY. Maximum background core is needed and made available by the key-in "FMEM 0".

The Pattern Program is segmented into a FORTRAN main program (UTCSIN), a FORTRAN subroutine (PTNRAD) and a Macro-Symbol Assembly language subroutine (PATOUT). The main program (UTCSIN) reads the basic pattern information (see following data deck organization items 1 through 6) and computes the required UTCS pattern parameters. These values are then passed to PTNRAD which formats them for storage on the RAD. PTNRAD also reads three additional inputs (see following data deck organization items 7 through 11). The first input, Pattern Number and Options card, specifies which pattern is being updated, whether a hexadecimal dump of the updated pattern is desired, and whether Volume and Occupancy History cards will be input. The second input, Offset and CIC Time of Day Flag cards, specifies which controllers are to be modified, the offset value (with resolution to one-half second), and the CIC Time of Day Flag. This input is used by PTNRAD in the following manner:

1. A card is read and the controller number (J) extracted.
2. The section (KSEC) containing controller J is determined.
3. The pattern corresponding to this section and the input pattern number (PTNN) are read into core by subroutine PATOUT, if it is not already resident.
4. Controller J's updated parameters, computed by UTCSIN, are inserted into the "boiler-plate" pattern.

This process continues until a controller number is read which corresponds to a different UTCS section. At that time, the current section's pattern is written to the RAD, by subroutine PATOUT, and the new section's pattern is read into memory. The source image of the routine is on magnetic tape (labeled PATGEN, dated 2/12/73). The file organization of the tape is: UTCSIN, PTNRAD, EOF, EOF, PATOUT, EOF. The procedure for executing the program is as follows:

1. Key-In "FMEM 0"
2. Mount source tape PATGEN on E0.
3. Run the following JOB:

```
!JOB 1,PATGEN
!STDLB (SI,BO)
!FORTRANH SI,LS,GO,X (See Note 1)
!MACRSYM SI,LO,GO (See Note 2)
!STDLB (SI,C)
!OLOAD (MAP,PROG)
:ROOT (FIL,BT,GO,EOD),(ENTRY,4MAIN)
!PAUSE KEY IN 'SYC'
!ROV
    PATTERN DATA CARDS
!FIN
```

Note 1: The FORTRAN options LS and X may be deleted. If a listing of the program is not desired, delete the LS option. The X option controls the compilation of the program. When specified, it will generate a version of the program that will give a complete printout of all input and computed pattern parameters. If the X option is deleted, the program generated will only output notifications of data input errors or inconsistencies.

Note 2: The Macro-Symbol LO option may be deleted if a listing of PATOUT is not desired.

The formats of controller, critical link, controller interval, pattern number and options, offset and CIC time of day flag, volume history, and occupancy history input cards are shown in Figures 4.5.2 through 4.5.8, respectively. Paragraphs 4.5.1 through 4.5.3 contain definitions of symbols used on the data decks. The data deck organization is as follows:

1. Controller Input Cards (Any number from 1 to 123, not necessarily in order.) These cards describe the basic characteristics of the controller.

2. 9998 Card (Termination code)

3. Critical Link Input Cards (Link numbers need not be in order, but all links for the controllers designated in item 1 must be entered.)

4. 9998 Card

5. Controller Interval Cards (Specified interval durations for designated controllers.)

6. 9998 Card

7. Pattern Number and Options Card. This card is read by subroutine PTNRAD. The card contains the pattern number being created/updated, and 2 software switches, PTNPRT and HISKEY. If PTNPRT is not zero, a hexadecimal dump of the pattern will be output. If HISKEY is not zero, the subroutine will expect volume and occupancy history cards to be input at items 10 and 11.

8. Offset and CIC Time of Day Flag Cards. Each card contains the controller number, offset and CIC TOD flag. Any number of intersections may be input in any order. These cards completely determine which controller's information will be modified in the designated pattern. Thus, if input was supplied for all 123 intersections in items 1 through 6, but only intersection number 27 was specified here, controller 27 would be the only one modified.

9. 00999 Card

10. Volume History Cards (16 cards). This input is optional (see item 7). All links must be input in numerical order (16 per card)

11. Occupancy History Cards (16 cards). This input is optional (see item 7). All links must be input in numerical order (16 per card).

12. Repeat items 5 through 11 for each pattern desired.

4.5.1 Controller Input Cards

These cards give the basic phasing information for each controller. They need not be changed if only interval length changes are made.

ADJ MIN - The minimum interval durations for the adjustable interval in each phase. These values are calculated by the program, if they are not supplied.

I - Controller number

IPHST - Phase Start Interval - Number of the first interval in each phase.

IPHEND - Phase End Interval - Number of the last interval in each phase.

KPH - Controller Type - This is number from 0 to 5 defined as follows:

0 = Two major phases only. (A and B)

1 = Three non-overlapping major phases (A, B and C)

2 = Three major phases where the first phase (A-phase) overlaps another phase (C-phase)

3 = Three major phases where the second phase (B-phase) overlaps a third phase (C-phase)

5 = Semi-actuated controller

This parameter corresponds to the UTCS glossary symbol K3PH.

NADJ - The adjustable interval number in each phase.

4.5.2 Critical Link Input Cards

These cards are given for each multi-detector (critical) links. They need only be changed if the phasing changes, not if only interval durations are changed.

I = Controller number

L = Link number

LDIR = Direction of flow on link

0 = outbound (from center of city)

1 = inbound (into center of city)

LMAJOR = Link importance factor. A subjective classification of links

1 = Major link, i.e., one with a large volume, relative to all system links.

0 = Minor link, i.e., one with relatively smaller volume.

NDIAL = Pattern number

IP = Phase during which flow takes place on link.

1 = first critical link on A phase (A1)

2 = second critical link on A-phase (A2)

3 = first critical link on B-phase (B1)

4 = second critical link on B-phase (B2)

5 = critical link on C-phase (C1)

NEND = Number of the last interval where traffic can flow on link

NSTAM = Number of the first amber interval on link
(Usually equal to NEND)

NSTG— Number of the first green interval for link

4.5.3 Controller Interval Cards

I = Controller number

Cycle Length = Duration of cycle in seconds

Interval lengths are in seconds

```
FORTRAN SI,LS,G9,X
   EXTENDED FIV-H, VERSION D00
     1            C     PROGRAM - UTCSIN  - CALCULATES PROGRAM VALUES FOR ALL DIALS  FOR        1D
     2            C                                    UTCS                                    2D
     3            C                                                                            25
     4                  DIMENSION KPH(125), IPHST(125,3),IPHEND(125,3),ADJMIN(125,3),          3D
     5                 1 AMIN(125,3),        NADJ(125,3),  LINK(125,5),                      4D
     6                 2GAB(125),GU(125,3),    GL(125,3),    QK(125,5),BUSPER(125,4),        50
     7                 3     EXTMAX(125,4),NSTG(300),NEND(300),LDIR(300),NSTAM(300),           6D
     8                 4     LMAJOR(300),   PHDUR(3), SUM(125,3)      ,IIN(10),XIN(16),       7D
     9                 5          GMIN(125,3),TKMIN(125),SUMTOT(125),GABC(125),GBC(125)       8D
    10                  DIMENSION ICYCLC(125),RINDUR(125,16)
    11                  COMMON /BLK1/LINK,       SUM,SUMTOT,GMIN,GAB,GBC,GABC,TKMIN,GU,GL,
    12                 1QK,BUSPER,EXTMAX,ICYCLC,RINDUR
    13            C                                                                            83
    14            C           ZERO CONTROLLER AND LINK INPUTS                                  85
    15            C                                                                            88
    16                  DO 10 I=1,125                                                          90
    17                  KPH(I) = 0                                                             91
    18                  DO 20 J = 1,5                                                          92
    19                2D LINK(I,J) = 0                                                         93
    20                  DO 1D K = 1,3                                                          94
    21                  IPHST(I,K)=0                                                           95
    22                  IPHEND(I,K)=0                                                          96
    23                  ADJMIN(I,K)=0.0                                                        97
    24                1D NADJ(I,K) = 0                                                         98
    25                  DO 30 I=1,300                                                          99
    26                  NSTG(I) = 0                                                           100
    27                  NEND(I)=0                                                             102
    28                  NSTAM(I) = 0                                                          104
    29                  LDIR (I) = 0                                                          106
    30                30 LMAJOR(I)=0                                                          110
    31            C                                                                           120
    32            C     READ CONTROLLER INPUT CARDS, WRITE HEADER                             130
    33            C                                                                           140
    34                  M=105                                                                 141
    35                  N=108                                                                 142
    36            X     WRITE(N,1000)                                                         150
    37            X1000 FORMAT(1H1,4X,10HCONTROLLER,8X,4HCONT,6X,18HSTART PHASE=INT NO,       160
    38            X    1   7X,16HEND PHASE=INT NO,                                           165
    39            X    2 7X,10HADJ INT NO,7X,18HMIN ADJ INT LENGTH,/7X,6HNUMBER,1DX,         170
    40            X    3 4HTYPE,9X,13HA     B     C,12X,11HA    B    C,1DX,9HA   B   C,      180
    41            X    1 9X,13HA     B     C//)                                              190
    42              110 READ(M,110D)I,(IIN(J),J=1,10),(XIN(K),K=1,3)                          200
    43              11DD FORMAT(I4,   I4,3(4X,3I4),4X,3F4.1)                                  210
    44                  IF(I - 125) 120,12D,130                                               220
    45                120 IF(I)160,16D,14D                                                    230
    46                140 KPH(I) = IIN(1)                                                     240
    47                  DO 150 IABC = 1,3                                                     250
    48                  IPHST(I,IABC) = IIN(IABC +1)                                          260
    49                  IPHEND(I,IABC)= IIN(IABC +4)                                          270
    50                  NADJ(I,IABC) = IIN(IABC +7)                                           280
    51                150 ADJMIN(I,IABC) = XIN(IABC)                                          290
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM

```
      X     WRITE(N,1200) I ,(IIN(J),J=1,10) , (XIN(K),K=1,3)                    300
     X1200 FORMAT(8X,I3,12X,I1,11X,I2,2(4X,I2),11X,I2,2(3X,I2),9X,I2,           310
     X    1  2(2X,I2),7X,F4.1,2(2X,F4.1))                                       320
           GO TO 110                                                            330
       130 IF(I - 9998)160,165,160                                              340
       160 WRITE(N,1300)I, (IIN(J),J=1,10), (XIN(K), K=1,3)                     350
      1300 FORMAT( /// 5X, 41HCONTROLLER INPUT CARD ERROR - CARD READS=//       360
     1    8X, I4,4X,I4,3(4X,3I4), 4X 3F5.1)                                    370
           STOP 1                                                               380
     C                                                                          385
     C           READ  LINK INPUT CARDS-WRITE HEADER                            390
     C                                                                          395
       165 CONTINUE
     X     WRITE(N,1400)                                                        400
     X1400 FORMAT(1H1,4X,4HCONT,2(5X,4HLINK),5X,9HSTART GRN,5X,9HEND AMBER,     410
     X    1 5X,11HSTART AMBER,5X,4HLINK,5X,5HMAJOR/6X,2HNO,7X,2HNO,6X,         420
     X    2 5HPHASE,5X,8HINTERVAL,9X,3HINT,11X,3HINT,10X,3HDIR,6X,4HLINK//)     430
       170 READ(M,1500) I,L,IP,(IIN(J),J=1,5)                                   440
      1500 FORMAT(3I4,4X,3I4,4X,2I4)                                            450
           IF (L - 300)180,180,190                                              460
       180 IF (L)190,190,210                                                    470
       210 LINK(I,IP) = L                                                       480
           NSTG(L) = IIN(1)                                                     490
           NEND(L) = IIN(2)                                                     500
           NSTAM(L) = IIN(3)                                                    510
           LDIR(L) = IIN(4)                                                     520
           LMAJOR(L) = IIN(5)                                                   530
     X     WRITE(N,1600) I,L,IP,(IIN(J),J=1,5)                                540
     X1600 FORMAT(5X,I3,6X,I3,8X,I1,10X,I2,12X,I2,12X,I2,11X,I1,9X,I1)          550
           GO TO 170                                                            560
       190 IF (I - 9998)200,220,200                                             570
       200 CONTINUE
     X     WRITE(N,1700)I,L,IP,(IIN(J), J=1,5)                                580
     X1700 FORMAT( /// 5X , 35HLINK INPUT CARD ERROR - CARD READS=//            590
     X    1  9X,3I4,4X,3I4,4X, 2I4)                                             600
           STOP 2                                                               602
     C                                                                          605
     C        READ AND PROCESS CONTROLLER INTERVAL CARDS                        610
     C                                                                          615
       220 DO 50 I = 1,125                                                      620
           TKMIN(I) = 0.0                                                       622
           SUMTOT(I) = 0.0                                                      624
           GAB(I) = 0.0                                                         626
           GABC(I) = 0.0                                                        628
           GBC(I) = 0.0                                                         630
           DO 60 J = 1,3                                                        632
           SUM(I,J)= 0.0                                                        634
           GMIN(I,J)= 0.0
           GU (I,J)= 0.0                                                        638
        60 GL (I,J) = 0.0                                                       640
           DO 90 J= 1,5                                                         642
        90 GK(I,J) = 0.0                                                        644
           DO 50 K = 1,4                                                        646
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
105              EXTMAX(I,K) = 0.0                                                  648
106            50 BUSPER(I,K) = 0.0                                                 650
107               DO 70 I=1,3                                                       652
108            70 PHDUR(I) = 0.0                                                    654
109               READ(M,1800)I,CYCLE,   JJ,(XIN(J),J=1,16)                         658
110          1800 FORMAT(I4,F4.0,I4,4X,16F4.1)                                      660
111           300 IF (I - 9998)230,250,240                                          670
112           240 STOP                                                              680
113           230 CONTINUE
114         X     WRITE(N,1900)JJ                                                  690
115         X1900 FORMAT(1H1,56X,7HDIAL NO,1XI2/5X,4HCONT,3X,5HCYCLE,3X,4HDIAL,     113 12.2
116         X    1  37X,22HINTERVAL LENGTH = SECS/6X,2HNO,5X,3HSEC,5X,2HNO,4X,1H1,  710
117         X    2  5X,1H2,5X,1H3,5X,1H4,5X,1H5,5X,1H6,5X,1H7,5X,1H8,5X,1H9,4X,     720
118         X    3  2H10,4X,2H11,4X,2H12,4X,2H13,4X,2H14,4X,2H15,4X,2H16//)         730
119           231 IF (I - 125)235,235,305                                           735
120           305 WRITE(N,2090)                                                     736
121          2090 FORMAT(5X, 24HFOLLOWING CARD IN ERROR=)                          737
122               GO TO 630                                                        738
123           235 IF(I) 236,236,237                                                740
124           236 WRITE (N, 2005)                                                  742
125          2005 FORMAT (5X, 'CONTROLLER NUMBER MISSING'    )                     746
126               STOP 3                                                          748
127           237 DURINT = 0.0                                                     749
128               DO 260 J = 1,16                                                  750
129           260 DURINT = DURINT + XIN(J)                                         760
130               IF (DURINT - CYCLE) 270,280,270                                  770
131           270 WRITE  (N,2000)                                                  780
132          2000 FORMAT(5X, 37HFOLLOWING CARD HAS WRONG INTERVAL SUM  /)          790
133           630 WRITE(N,2010)I, CYCLE,JJ, (XIN(J), J=1,16)                       800
134          2010 FORMAT(5X,I3,4X,F4.0,5X,I2,1X,16(2X,F4.1))                        113 12.2
135               GO TO 290                                                       820
136           280 CONTINUE
137         X     WRITE(N,2010)I, CYCLE,JJ ,(XIN(J), J=1,16)                       830
138               IF(CYCLE.EQ.(40.)) GO TO 9901
139               IF(CYCLE.EQ.(50.)) GO TO 9905
140               IF(CYCLE.EQ.(60.)) GO TO 9906
141               IF(CYCLE.EQ.(70.)) GO TO 9902
142               IF(CYCLE.EQ.(80.)) GO TO 9903
143               ICYCLC(I) = 5                                                  90 SEC
144               GO TO 9904                                                     90 SEC
145          9901 ICYCLC(I) = 0                                                  40 SEC
146               GO TO 9904                                                     40 SEC
147          9905 ICYCLC(I) = 1                                                  50 SEC
148               GO TO 9904                                                     50 SEC
149          9906 ICYCLC(I) = 2                                                  60 SEC
150               GO TO 9904                                                     60 SEC
151          9902 ICYCLC(I) = 3                                                  70 SEC
152               GO TO 9904                                                     70 SEC
153          9903 ICYCLC(I) = 4                                                  80 SEC
154          9904 DO 9910 J    = 1,16
155          9910 RINDUR(I,J) = XIN(J)
156               DO 310 IABC = 1,3                                                840
157               IF (KPH(I) .GT. 3 )  GO TO 290                                   845
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
      PHDUR(IABC) = 0.0                                                  8 0
      INT = IPHST(I,IABC)                                                 860
      IF(INT)5100,5100,330                                                870
5100  IF(IABC-3) 320,5200,5200                                            875
5200  IF(KPH(I)) 310,310,320                                              878
 320  WRITE (N,2020) I
2020  FORMAT(6X, 33HINPUT DATA MISSING FOR CONTROLLER ,2X,I3//)           890
      GO TO 290                                                           900
 330  IF (IPHEND(I,IABC)) 320,320,340                                     910
 340  IF (IPHEND(I,IABC) - 16) 350,350,320                                920
 350  IF (INT - 16) 360,360,320                                           930
 360  DO 370 J =INT,16                                                    940
      PHDUR(IABC) = PHDUR(IABC) + XIN(J)                                  950
      IF (J - IPHEND(I,IABC)) 370,311,370                                 960
 370  CONTINUE
      INT = 1
      GO TO 360                                                           990
 311  GU(I,IABC) = 0.8 * PHDUR(IABC)                                      994
      GL(I,IABC) = 0.6 * PHDUR(IABC)                                      997
 310  CONTINUE                                                           1000
      DEC1 = 0.0                                                         1010
      DEC2 = 0.0                                                         1020
      DO 380 IABC = 1,3                                                  1030
      J = NADJ(I,IABC)                                                   1040
      IF (J) 410,410,430                                                 1050
 430  IF(J - 16) 470,470,320                                             1060
 470  AMIN(I,IABC)  =  ADJMIN(I,IABC)                                    1065
      IF(  AMIN(I,IABC))471,471,460                                      1070
 471  IF(XIN (J) - 7.5) 480,480,490                                      1090
 480    AMIN(I,IABC) = XIN (J)                                           1100
      GO TO 460                                                          1110
 490  IF (XIN (J) - 19) 500,500,510                                      1120
 500    AMIN(I,IABC)= 7.0   + XIN(J) - AINT (XIN(J))                     1130
      GO TO 460                                                          1140
 510  IF (XIN (J) - 24.0) 520,520,530                                    1150
 520    AMIN (I,IABC)= XIN(J) - 12.0                                     1160
      GO TO 460                                                          1170
 530    AMIN(I,IABC)=AINT((XIN(J)+1.1)/2.) + XIN(J) - AINT(XIN(J))       1180
 460  IF(IABC-3)465,505,465                                              1190
 505  IF(KPH(I)-1)550,465,550                                            1200
 550  GMIN(I,3)=   AMIN(I,3)                                             1205
      GO TO 425                                                          1207
 465  SUM(I,IABC) = PHDUR(IABC) - XIN(J)                                 1220
      GMIN(I,IABC) = SUM(I,IABC)+  AMIN(I,IABC)                          1230
      DEC1 = DEC1 + XIN(J) -   AMIN(I,IABC)                              1240
 380  DEC2 = DEC2 + GMIN(I,IABC)                                         1250
      GO TO 540                                                          1255
 410  IF (IABC-3) 320,415,320                                            1260
 415  IF (KPH(I)-1) 425,320,425                                          1265
 425  IF (KPH(I)-2 )545,440,450                                          1270
 440  K=1                                                                1275
      GO TO 445                                                          1280
 450  K=2                                                                1285
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
211          445 J = NADJ(I,K)                                                  12Z
212              SUM(I,3) = PHDUR(3) = XIN(J) +   AMIN(I,K)                     1300
213          545 J = NADJ(I,3)                                                  1310
214              IF (J) 540,540,548                                             1315
215          548 DEC1 = DEC1 + XIN(J) =   AMIN(I,3)                             1320
216          540 TKMIN(I) = CYCLE = DEC1                                        1330
217              SUMTGT(I) = TKMIN(I) = DEC2                                    1340
218              GAP(I) = PHDUR(1) + PHDUR(2)                                   1350
219              IF(KPH(I) = 2)560,570,580                                      1360
220          560 IF (KPH(I) .EQ. 1) GABC(I) = GAB(I) + PHDUR(3)                 1370
221              GO TO 590                                                      1380
222          570 J = 2                                                          1390
223              GO TO 600                                                      1400
224          580 J = 1                                                          1410
225          600 GSC(I) = PHDUR(J) + PHDUR(3)                                   1420
226          590 IF (LINK(I,1)) 290,290,610                                     1430
227          610 IK = 0                                                         1435
228              DO 620 J=1,5                                                   1440
229              L = LINK(I,J)                                                  1450
230              IF(L) 620,620,635                                              1460
231          635 IK = IK + 1                                                    1465
232              PHDURL = 0.0                                                   1470
233              INT = NSTG(L)                                                  1480
234              JL = NEND(L)                                                   1490
235              IF (INT) 640,640,650                                           1500
236          650 IF(INT = 16) 670,670,640                                       1510
237          640 WRITE(N,2030)L , I                                             1520
238         2030 FORMAT(6X, 21HDATA MISSING FOR LINK ,2X,I3,2X,10HCONTROLLER,2X,I3) 1530
239              GO TO 290                                                      1540
240          670 IF(JL) 640,640,680                                             1550
241          680 IF(JL = 16)690,690,640                                         1560
242          690 DO 700 K = INT,16                                              1570
243              PHDURL = PHDURL + XIN(K)                                       1580
244              IF (K = JL) 700,710,700                                        1590
245          700 CONTINUE                                                       1600
246              INT =1                                                         1610
247              GO TO 690                                                      1620
248          710 AMBDUR =0                                                      1650
249              INT = NSTAM(L)                                                 1660
250              IF(INT) 640,640,720                                            1670
251          720 IF (INT = JL) 730,730,640                                      1680
252          730 DO 740 K = INT, JL                                             1690
253          740 AMBDUR = AMBDUR + XIN(K)                                       1700
254              BUSPER(I,IK)=PHDURL = AMBDUR = 1.0                             1710
255              IF (JJ = 5) 745,760,755                                        1715
256          745 IF (JJ = 2) 750,760,770                                        1720
257          755 CONTINUE                                                       1725
258          750 IF(LMAJOR(L)) 790,790,780                                      1730
259          780 GK(I,J) = 1.0                                                  1740
260          790 GK(I,J) = 1.0 + GK(I,J)                                        1750
261              GO TO 800                                                      1760
262          760 IF (LMAJOR(L)) 810,810,820                                     1770
263          810 IF (LDIR(L)) 830,830,840                                       1780
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
264          820 IF(LDIR(L)) 840,840,850                                          1790
265          770 IF (LMAJ8R(L)) 860,860,870                                       1800
266          860 IF (LDIR(L)) 840,840,830                                         1810
267          870 IF (LDIR(L)) 850,850,840                                         1820
268          850 GK(I,J) = 1.0                                                    1830
269          840 GK(I,J) = 1.0 + GK(I,J)                                          1840
270          830 GK(I,J) = 3.0 + GK(I,J)                                          1850
271          800 IF(J -4) 880,880,890                                             1860
272          880 IABC = (J+1)/2                                                   1870
273              G8 T8 900                                                        1880
274          890 IABC = 0                                                         1890
275              IF (KPH(I) -2)910,920,930                                        1900
276          910 IF (KPH(I)) 620,620,940                                          1910
277          940 IABC = 1                                                         1920
278          930 IABC = 1 + IABC                                                  1930
279          920 IABC = 1 + IABC                                                  1940
280          900 K = NADJ(I,IABC)                                                 1950
281              TEMP = XIN(K) -   AMIN(I,IABC)                                   1960
282              IF (TEMP -5.)620,950,950                                         1970
283          950 IF (TEMP - 10.)960,960,970                                       1980
284          960 EXTMAX(I,IK) = TEMP                                              1990
285              G8 T8 620                                                        2000
286          970 EXTMAX(I,IK)= 10.                                                2010
287          620 C8NTINUE                                                         2020
288          290 READ(N,1800)I,CYCLE,NDIAL,(XIN(J),J=1,16)                        2030
289              IF(I - 9998) 980,250,240                                         2040
290          980 IF(NDIAL - JJ) 990,231,990                                       2050
291          990 WRITE (N,2040)                                                   2060
292         2040 F8RMAT(6X, 32HF9LL8WING CARD HAS WR8NG DIAL N8  //)              2070
293              G8 T8 630                                                        2080
294      C                                                                        2090
295      C        PRINT 8UT PATTERN DATA                                          2100
296      X2050 F8RMAT(1H1,53X, 11HDIAL NUMBER,1X,I2///                    113 12.2
297      X     1           1X,7HC8NT N8,5X,5HTKMIN,5X,4HSUMA,6X,4HSUMB,6X,4HSUMC,  2120
298      X     2 5X,6HSUMT8T,5X,5HGAMIN,5X,5HGBMIN,5X,5HGCMIN,6X,3HGAB,7X,      2130
299      X     3 3HGBC,7X,4HGABC//)                                               2140
300      X2060 F8RMAT(3X,I3,7X,F5.1,5X,F4.1,3(6X,F4.1),6X,F5.1,2(5X,F5.1),        2150
301      X     1   3(5X,F5.1))                                                   2160
302      X2070 F8RMAT(1H1,53X, 11HDIAL NUMBER,1X,I2 ///7X,4HC8NT,12X,2H8K,14X,   113 12.2
303      X     1  14HMAX EXTENSI8NS,12X,2HGU,15X,2HGL,12X,16HBUS LINK PERI8DS /   2180
304      X     2  8X,2HN8,7X,14HA1 A2 B1 B2 C1,7X,16H1    2    3    4, 8X,      2190
305      X     3  9HA   B   C,8X,9HA   B   C,8X,16H1    2    3    4   //)       2200
306      X2080 F8RMAT(7X,I3,6X,5(1X,I2),4X,4(2X,F3.0),5X,3(1X,F3.0),5X,3(1X,      2210
307      X     1  F3.0), 4X, 4(2X,F3.0))                                          2220
308        250 C8NTINUE
309      X      WRITE (N,2050)  JJ                                                2225
310      X      D8 3000 I = 1,125                                                 2230
311      X      IF (TKMIN(I))3000,3000,3010                                       2240
312      X3010 WRITE(N,2060)I,TKMIN(I),(SUM(I,J),J=1,3),SUMT8T(I),(GMIN(I,K),     2250
313      X     1   K=1,3), GAB(I), GBC(I), GABC(I)                               2260
314      X3000 C8NTINUE                                                          2270
315      X      WRITE (N,2070)  JJ                                               2280
316      X      D8 3100  I = 1,125                                               2290
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
317         X     IF (QK(I,1)) 3100,3100,3200                                    2300
318         X3200 WRITE(N,2080)I,(QK(I,J),J=1,5),(EXTMAX(I,IP),IP=1,4),(GU(I,K),  2310
319         X    1   K=1,3),(GL(I,L),L=1,3), (BUSPER(I,LL),LL=1,4)               2320
320         X3100 CONTINUE                                                       2330
321               CALL PTNRAD
322               GO TO 220                                                      2340
323               END                                                            2350

SUBPROGRAMS

  &MAIN      F:105      F:106      F:108      9INITIAL   M:00       M:0C       9BCDWRIT
  9ENDIOL    9BCDREAD   9I0DATA    9STOP      9ITOR      AINT       PTNRAD

PROGRAM ALLOCATION

7C8.0     I         7C9.0     J         7CA.0     K         7CB.0     M         7CC.0     N
7CD.0     IABC      7CE.0     L         7CF.0     IP        7D0.0     CYCLE     7D1.0     JJ
7D2.0     DURINT    7D3.0     INT       704.0     DEC1      7D5.0     DEC2      7D6.0     IK
7D7.0     PHOURL    708.0     JL        709.0     AMBDUR    7DA.0     TEMP      70B.0     NOIAL
70C.0     LL

7DD.0     KPH       85A.0     IPHST     9D1.0     IPHEND    B48.0     ADJMIN    CBF.0     AMIN
E3A.0     NADJ      FAD.0     NSTG      1009.0    NEND      1205.0    LDIR      1331.0    NSTAM
145D.0    LMAJOR    1589.0    PHDUR     158C.0    IIN       1596.0    XIN

PROGRAM SIZE 15A6


/BLK1     / ALLOCATION 1964    WORDS

0.0       LINK      271.0     SUM       3E8.0     SUMTOT    465.0     GMIN      5DC.0     GAB
659.0     GBC       606.0     GABC      753.0     TKMIN     7D0.0     GU        947.0     GL
ABF.0     QK        02F.0     BUSPER    F23.0     EXTMAX    1117.0    ICYCLC    1194.0    RINOUR



PROGRAM END
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
      SUBROUTINE PTNRAD
      DIMENSION LINK(125,5),PTN(710),ICYCLC(125),SUM(125,3),SUMTOT(125)
     1,GMIN(125,3),GAB(125),GBC(125),GABC(125),TKMIN(125),RINDUR(125,16)
     2,GU(125,3),GL(125,3),QK(125,5),BUSPER(125,4),EXTMAX(125,4)
     3,CONSEC(125),VOLH(256),OCCH(256),ICPOS(125),LNKST(4),HISTLOC(4)
     4,LNKEND(4)
      DIMENSION IBYTE(4)
      DIMENSION    SECLKN(256)                                          113 12.2
      COMMON /BLK1/ LINK,SUM,SUMTOT,GMIN,GAB,GBC,GABC,TKMIN,GU,GL,QK,
     1BUSPER,EXTMAX,ICYCLC,RINDUR
      COMMON PTN
      INTEGER PTN,PTNN,CONSEC,VOLH,OCCH,HISTLOC
      INTEGER  PTNPRT,HISKEY
      INTEGER      SECLKN                                               113 12.2
      DATA CONSEC /0,1,1,1,1,1,1,99,1,1,1,1,0,0,0,0,0,0,0,0,
     1             0,1,0,2,2,2,2,2,3,3,3,3,3,3,3,3,3,3,3,3,3,           113 12.2
     2             3,3,3,3,3,3,3,3,3,3,3,3,3,2,2,2,3,3,2,2,
     3             2,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2,99,99,99,
     4             2,2,2,2,2,2,2,2,2,2,2,99,2,2,99,2,2,99,2,2,
     5             99,99,1,1,1,1,99,99,3,3,3,3,3,3,3,3,3,3,1,
     6             1,1,1,99,99/
      DATA  ICPOS/1,1,9,17,25,33,41,0,49,64,79,94,9,17,25,
     1            40,48,63,71,79,87,109,95,1,9,17,25,1,9,17,            113 12.2
     2            25,40,48,63,71,79,87,95,103,111,126,141,156,164,172,
     3            187,195,203,211,226,241,249,257,33,48,63,272,287,71,  113 12.2
     4            86,101,116,124,132,147,155,170,178,193,208,223,231,   113 12.2
     5            246,261,269,277,292,0,0,0,307,315,330,338,353,368,    113 12.2
     6            383,398,413,428,436,0,451,466,0,481,489,0,504,519,    113 12.2
     7            0,0,117,125,133,141,0,0,295,303,311,319,327,335,343,
     8            358,366,374,382,149,164,179,187,0,0/
      DATA SECLKN /1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,         113 12.2
     1             50,51,52,53,54,55,56,57,                            113 12.2
     2             19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,       113 12.2
     3             34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,    113 12.2
     4             58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,    113 12.2
     5             74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,    113 12.2
     6             90,91,92,93,94,95,96,97,98,99,100,101,102,103,104,  113 12.2
     7             105,106,107,108,109,110,111,112,113,114,115,116,    113 12.2
     8             117,118,119,120,121,122,123,124,125,126,127,128,    113 12.2
     9             129,130,131,132,133,134,135,136,137,138,139,140,    113 12.2
     1             141,142,143,144,145,146,147,148,149,150,151,152,    113 12.2
     2             153,154,155,156,157,158,159,160,161,162,163,164,    113 12.2
     3             165,166,167,168,169,170,171,172,173,174,175,176,    113 12.2
     4             177,178,179,180,181,182,183,184,185,186,187,188,    113 12.2
     5             189,190,191,192,193,194,195,                        113 12.2
     6             196,197,198,199,200,201,202,203,204,205,206,207,    113 12.2
     7             208,209,210,211,212,213,214,215,216,217,218,219,    113 12.2
     8             220,221,222,223,224,225,226,227,228,229,230,231,    113 12.2
     9             232,233,234,235,236,237,238,239,240,241,242,243,    113 12.2
     1             244,245,246,247,248,249,250,251,252,253,254,255,    113 12.2
     2             256/                                                113 12.2
      DATA HISTLOC/103,202,534,390/                                      113 12.2
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
53                DATA LNKST  /1,27,58,196/                                  113 12.2
54                DATA LNKEND /26,57,195,256/                                113 12.2
55                DATA IBYTE  /129,233,672,451/                              113 12.2
56                READ (105,107)  PTNN,PTNPRT,HISKEY
57                KSEC = -1
58          X     WRITE (108,105)
59              5 READ (105,100)  J, OFFSET, ICICTD
60                IF (J .EQ. 999)   GO TO 200
61                IF (J .GT. 123)   GO TO 500
62          X     WRITE (108,106) J,OFFSET,ICICTD
63                I = CONSEC(J)
64                IF (I .EQ. 99)   GO TO 500
65                IF (KSEC .EQ. I) GO TO 3
66                CALL PATOUT (PTNN,KSEC,I)
67                KSEC = I
68              3 K = ICPOS(J)
69                PTN(K) = J*(2**24)
70                NCL = 0
71                DO 2 I2 = 1,5
72                IF (LINK(J,I2) .NE. 0) NCL = NCL + 1
73              2 CONTINUE
74                PTN(K) = PTN(K) + NCL*(2**16)
75                ITEMP = OFFSET*2. + .5
76                PTN(K) = PTN(K) + ITEMP*(2**8)
77                PTN(K) = PTN(K) + ICYCLC(J)
78                K = K + 1
79                ITEMP = SUM(J,1)*2. + .5
80                PTN(K) = ITEMP*(2**24)
81                ITEMP = SUM(J,2)*2. + .5
82                PTN(K) = PTN(K) + ITEMP*(2**16)
83                ITEMP = SUM(J,3)*2. + .5
84                PTN(K) = PTN(K) + ITEMP*(2**8)
85                ITEMP = SUMTOT(J)*2. + .5
86                PTN(K) = PTN(K) + ITEMP
87                K = K + 1
88                ITEMP = GMIN(J,1)*2. + .5
89                PTN(K) = ITEMP*(2**24)
90                ITEMP = GMIN(J,2)*2. + .5
91                PTN(K) = PTN(K) + ITEMP*(2**16)
92                ITEMP = GMIN(J,3)*2. + .5
93                PTN(K) = PTN(K) + ITEMP*(2**8)
94                K = K + 1
95                ITEMP = GAB(J)*2. + .5
96                PTN(K) = ITEMP*(2**24)
97                ITEMP = GBC(J)*2. + .5
98                PTN(K) = ITEMP*(2**16) + PTN(K)
99                ITEMP = GABC(J)*2. + .5
100               PTN(K) = PTN(K) + ITEMP*(2**8)
101               ITEMP = TKMIN(J)*2. + .5
102               PTN(K) = PTN(K) + ITEMP
103               DO 4 I4 = 1,4
104               K = K + 1
105               INT = 4*(I4-1) + 1
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
      ITEMP = RINDUR(J,INT)*2. + .5
      PTN(K) = ITEMP*(2**24)
      INT = 4*(I4-1) + 2
      ITEMP = RINDUR(J,INT)*2. + .5
      PTN(K) = PTN(K) + ITEMP*(2**16)
      INT = 4*(I4-1) + 3
      ITEMP = RINDUR(J,INT)*2. + .5
      PTN(K) = PTN(K) + ITEMP*(2**8)
      INT = 4*(I4-1) + 4
      ITEMP = RINDUR(J,INT)*2. + .5
     & PTN(K) = PTN(K) + ITEMP
      IF(NCL.EQ.0) GO TO 5
      K = K + 1
      ITEMP = GU(J,1)*2. + .5
      PTN(K) = ITEMP*(2**24)
      ITEMP = GU(J,2)*2. + .5
      PTN(K) = PTN(K) + ITEMP*(2**16)
      ITEMP = GU(J,3)*2. + .5
      PTN(K) = PTN(K) + ITEMP*(2**8)
      PTN(K) = PTN(K) + ICICTD
      K = K + 1
      ITEMP = GL(J,1)*2. + .5
      PTN(K) = ITEMP*(2**24)
      ITEMP = GL(J,2)*2. + .5
      PTN(K) = PTN(K) + ITEMP*(2**16)
      ITEMP = GL(J,3)*2. + .5
      PTN(K) = PTN(K) + ITEMP*(2**8)
      K = K + 1
      ITEMP = QK(J,1)*4. + .5
      PTN(K) = ITEMP*(2**24)
      ITEMP = QK(J,3)*4. + .5
      PTN(K) = PTN(K) + ITEMP*(2**16)
      ITEMP = QK(J,5)*4. + .5
      PTN(K) = PTN(K) + ITEMP*(2**8)
      K = K + 1
      ITEMP = QK(J,2)*4. + .5
      PTN(K) = ITEMP*(2**24)
      ITEMP = QK(J,4)*4. + .5
      PTN(K) = PTN(K) + ITEMP*(2**16)
      ITEMP = 2.46*4. + .5
      PTN(K) = PTN(K) + ITEMP*(2**8)
      PTN(K) = PTN(K) + ITEMP
      K = K + 1
      PTN(K) = ITEMP*(2**24)
      PTN(K) = PTN(K) + ITEMP*(2**16)
      PTN(K) = PTN(K) + ITEMP*(2**8)
      K = K + 1
      ITEMP = AUSPER(J,1) + .5
      PTN(K) = ITEMP*(2**24)
      ITEMP = AUSPER(J,2) + .5
      PTN(K) = PTN(K) + ITEMP*(2**16)
      ITEMP = AUSPER(J,3) + .5
      PTN(K) = PTN(K) + ITEMP*(2**8)
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
159               ITEMP = BUSPER(J,4) + .5
160               PTN(K) = PTN(K) + ITEMP
161               K = K + 1
162               ITEMP = EXTMAX(J,1)*2. + .5
163               PTN(K) = ITEMP*(2**24)
164               ITEMP = EXTMAX(J,2)*2. + .5
165               PTN(K) = PTN(K) + ITEMP*(2**16)
166               ITEMP = EXTMAX(J,3)*2. + .5
167               PTN(K) = PTN(K) + ITEMP*(2**8)
168               ITEMP = EXTMAX(J,4)*2. + .5
169               PTN(K) = PTN(K) + ITEMP
170               GO TO 5
171            200 CALL PATOUT (PTNN,KSEC,KSEC)
172               IF(HISKEY .NE. 0) READ(105,109) (VOLH(I), I=1,256),
173              1         (OCCH(J), J=1,256)
174            201 DO 110 J = 0,3
175               CALL PATOUT (PTNN,-1,J)
176               IF (HISKEY .EQ. 0)  GO TO 202
177               K = LNKST(J+1)
178               K = SECLKN(K)                                                    113 12.2
179               I = LNKEND(J+1)
180               I = SECLKN(I)                                                    113 12.2
181               L = HISTLOC(J+1)
182               DO 111 M = K,I
183               PTN(L) = VOLH(M)*(2**17)
184               PTN(L) = PTN(L) + OCCH(M)*32.768
185            111 L = L + 1
186               CALL PATOUT (PTNN,J,J)
187            202 L = J + 1
188               K = IBYTE(J+1)
189               IF(PTNPRT .NE. 0) WRITE(108,99) PTNN,L, (PTN(I), I=1,K)
190            110 CONTINUE
191               RETURN
192            500 WRITE (102,108)  J
193               PAUSE 222
194               GO TO 5
195             99 FORMAT (//// 20X, 'PATTERN NUMBER', I2, 5X, 'SECTION',I2 //,
196              1       8(2X,Z8))
197            100 FORMAT (I5,F5.1,I2)
198           X 105 FORMAT (20X,'CONTROLLER',5X,'OFFSET',5X,'CIC TOD FLAG' //)
199           X 106 FORMAT (22X,I4,9X,F5.1,11X,I2)
200            107 FORMAT (3I5)
201            108 FORMAT (// 'CONTROLLER', I4, '  NONEXISTENT',// 'CORRECT CARD AND
202              1INPUT AGAIN' /)
203            109 FORMAT (16I5)
204               END

SUBPROGRAMS

  $BCDREAD   $IODATA    $BCDWRIT   $ENDIOL    PATOUT     $POWII     $RTOI      $ITOR
  $PAUSE     $SETUPO    $BFISR
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
PROGRAM ALLOCATION

38C.0     PTNRAD   38D.0     PTNN     38E.0     PTNPRT   38F.0     HISKEY   390.0     KSEC
391.0     J        392.0     OFFSET   393.0     ICICTD   394.0     I        395.0     K
396.0     NCL      397.0     I2       398.0     ITEMP    399.0     I4       39A.0     INT
39B.0     L        39C.0     M

39D.0     CONSEC   41A.0     VALH     51A.0     OCCH     61A.0     ICPOS    697.0     LNKST
69B.0     HISTLOC  69F.0     LNKEND   6A3.0     IBYTE    6A7.0     SECLKN

PROGRAM SIZE 7A7

/BLK1     / ALLOCATION 1964    WORDS

0.0       LINK     271.0     SUM      3E8.0     SUMTOT   465.0     GMIN     5DC.0     GAB
659.0     GBC      6D6.0     GABC     753.0     TKMIN    7D0.0     GU       947.0     GL
ABE.0     OK       D2F.0     BUSPER   F23.0     EXTMAX   1117.0    ICYCLC   1194.0    RINDUR


/FLICOM   / ALLOCATION 2C6     WORDS

0.0       PTN


PROGRAM END
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
C00   09:02  MAR 11, '74                                                                    1
      1                                *
      2                                         DEF       PAT0UT
      3   01 00000                     F4:C0M   DSECT
      4   01 00000                     PTN      RES       710
      5   02 00000                              CSECT
      6         00000004               NSECT    EQU       4                    NUMB 0F SECTI0NS
      7   02 00000    C2200000 A       PAT0UT   LCI       0                    SAVE REGS
      8   02 00001    2300001E                  STM,0     REGSAV               SAVE REGS
      9   02 00002    0410002E                  CAL1,1    0PNPTN               0PEN PATTERN RAD FILE
     10   02 00003    3270000F A                LW,7      15                   GET CALLING SEQ ADDR IN R7
     11   02 00004    325E0000 A                LW,5      0,7                  GET FIRST ARGUMENT ADDRESS
     12   02 00005    324E0001 A                LW,6      1,7                  GET SECND ARGUMENT ADDRESS
     13   02 00006    327E0002 A                LW,7      2,7                  GET THIRD ARGUMENT ADDRESS
     14   02 00007    326C0000 A                LW,6      0,6                  GET LAST SECTI0N NUMBER USED
     15   02 00008    69100010                  BLZ       READNEW              1ST PASS--READ IN SECTI0N'S DATA
     16   02 00009    32300040                  LW,11     GRANRD               GET DISK ADDR 0F PATTERN FR0M BEF0RE
     17   02 0000A    35300038                  STW,11    GRANWRT              ST0RE IN FPT T0 WRITE
     18   02 0000B    32B0003F                  LW,11     RDBYTE               GET NUMB BYTES T0 TRANSFER
     19   02 0000C    35B00037                  STW,11    WRTBYT               AND STR IN WRITE FPT
     20   02 0000D    04100032                  CAL1,1    WRTPTN               WRITE PATTERN T0 RAD
     21   02 0000E    316F0000 A                CW,6      0,7                  SEE IF NEW SECT REQUIRED, 0R END
     22   02 0000F    68300019                  BE        EXITPAT              END, EXIT
     23   02 00010    325A0000 A     READNEW   LW,5      0,5                  GET PATTERN NUMBER
     24   02 00011    205FFFFF A                AI,5      -1                   MAKE INDEX
     25   02 00012    23500004 A                MI,5      NSECT                NSECT*(PATN-1)
     26   02 00013    323E0000 A                LW,3      0,7                  GET NEW SECTI0N NUMBER
     27   02 00014    30500003 A                AW,5      3                    NSECT*(PATN-1) + SECTNUM
     28   02 00015    35500040                  STW,5     GRANRD               SET DISK ADDR IN READ FPT
     29   02 00016    5256004A                  LH,5      PATBYT,3             GET NUMB BYTES IN PATTERN
     30   02 00017    3550003F                  STW,5     RDBYTE               STR IN READ FPT
     31   02 00018    0410003A                  CAL1,1    RDPTN                READ IN PATTERN
     32   02 00019    04100030       EXITPAT   CAL1,1    CLSPTN               CL0SE RAD FILE
     33   02 0001A    02200000 A                LCI       0                    RESTORE REGS
     34   02 0001B    2A00001E                  LM,0      REGSAV               RESTORE REGS
     35   02 0001C    20F00003 A                AI,15     3                    F0RM EXIT ADDRESS
     36   02 0001D    E800000F A                B         *15                  EXIT T0 MAIN
     37   02 0001E                     REGSAV   RES       16
     38   02 0002E    1400004C       0PNPTN   GEN,8,24   X'14',F:PTN
     39   02 0002F    00000000 A                DATA      0
     40   02 00030    1500004C       CLSPTN   GEN,8,24   X'15',F:PTN
     41   02 00031    00000000 A                DATA      0
     42   02 00032    1100004C       WRTPTN   GEN,8,24   X'11',F:PTN
     43   02 00033    F1400018 A                GEN,4,4,2,22   15,1,1,24
     44   02 00034    00000042                  DATA      ERR0R,ERR0R,PTN,0,0,0
          02 00035    00000042
          02 00036    00000000 01
          02 00037    00000000 A
          02 00038    00000000 A
          02 00039    00000000 A
     45         02 00038            GRANWRT   EQU       WRTPTN+6             KEY L0C IN FPT
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
C00   09:02  MAR 11, '74                                                                    2
     46          02 00037              WRTBYT   EQU       WRTPTN+5              BYTE COUNT LOC IN FPT
     47    02 00038     10000004C      RDPTN    GEN,8,24  X'10',F:PTN
     48    02 00038     F1400010 A              GEN,4,4,2,22   15,1,1,16
     49    02 0003C     00000042                DATA      ERROR,EXITPAT,PTN,0,0,0
           02 00040     00000019
           02 00044     00000000 01
           02 00048     00000000 A
           02 0004C     00000000 A
           02 00050     00000000 A
     50          02 00040              GRANRD   EQU       RDPTN+6              KEY LOC IN FPT
     51          02 00043              RDBYTE   EQU       RDPTN+5              BYTE COUNT LOC IN FPT
     52    02 00054     04200044       ERROR    CAL1,2    TYPE                 TYPE ERROR MESS TO CONSOLE
     53    02 00058     04900001 A              CAL1,9    1                    EXIT
     54    02 0005C     02000000 A     TYPE     GEN,8,24  X'02',0
     55    02 00060     80000010 A              DATA      X'80000010',ERRMESS
           02 00064     00000047
     56    02 00068     C9D9C1C4 A     ERRMESS  TEXTC     'RAD ERROR'
           02 0006C     40C5D9D9 A
           02 00070     D6D94040 A
     57    02 00074     0204     A     PATBYT   DATA,2    516,932,2688,1804    PAT LENGTH IN BYTES PER SECTION  113 12.2
           02 00074 2   0344     A
           02 00078     0A80     A
           02 0007C 2   0708     A
     58    02 00080     07000001 A     F:PTN    GEN,8,24       7,1
     59    02 00084     02000900 A              GEN,8,8,8,8     2,0,9,0
     60    02 00088     00000000 A              DATA      0,0,0
           02 0008C     00000000 A
           02 00090     00000000 A
     61    02 00094     D7E3D540 A              TEXT      'PTN
           02 00098     40404040 A
     62                                        END
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
COO   09:02  MAR 11, '74
   SYMBOL VALUES:
      CLSPTN/02 00030          ERRMESS/02 00047         ERROR/02 00042           EXITPAT/02 00019
      F:PTN/02 0004C           F4:COM/01 00000          GRANRD/02 00040          GRANWRT/02 00038
      NSECT/00000004           OPNPTN/02 0002E          PATBYT/02 0004A          PATOUT=02 00000
      PTN/01 00000             RDBYTE/02 0003F          RDPTN/02 0003A           READNEW/02 00010
      REGSAV/02 0001E          TYPE/02 00044            WRTBYT/02 00037          WRTPTN/02 00032

   ERROR SEVERITY LEVEL: 0
   NO  ERROR LINES
 STDLB (SI,C)
 SLOAD
:ROOT (FIL,ST,GO,FOD),(ENTRY,4MAIN)

WARNING: PROGRAM EXCEEDS SPECIFIED ADDR LIMITS
LOADING WAS COMPLETED
 PAU  SYC
 ROV
```


FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
PROGRAM MAP
BACKGROUND PROGRAM


 FILE  BT,OV
 NUMBER OF OVERLAY SEGMENTS      0
 LIMITS  FWA   1A00   LWA   6086
 BOUND     2
 BLANK COMMON  BASE   5CF2  SIZE    710
 PUBLIC LIBRARIES   NONE
 TOTAL FILE SIZE   4328/ 17192  WORDS   C1/ 193  GRANULES
 LIBRARY SIZE    CE4/  3300  WORDS
 PROGRAM ERROR SEVERITY  0


ROOT

 INPUT LIBRARY  TOTAL SIZE  P1FWA  P1LWA   SIZE  P2FWA  P2LWA   SIZE
  360E    CE4   43F0 17392  1A00   5CF2   42F2   5F88   6086     FE

 OVLOAD   PCB  ENTRY  TSFWA   SIZE  DCBTAB INTTAB  INSEV  LDSEV
     0  1A00  1A0E   5FEE    200   5FDC      0      0      0

  CONTROL SECTIONS
    ROM        1      1A0E     5642
    ROM        2      4918     1497
    ROM        3      4EBA       83

    SDCB          F:105          5F38
    SDCB          F:106          5F9F
    SDCB          F:108          5FC6
    SDCB          M:DA           5FCD
    SDCB          M:BC           5FD4

    DSCT  IM    F4:COM           5CF2  0      710
     DEF  IM    PEND             6036  0
     DEF  IM    4MAIN            1A0E  0
     DEF  IM    PTRRAD           4C69  0
    DSCT  IM    BLK1             2FB4  0     6500
     DEF  IM    PATOUT           4EBA  0
LOADING WAS COMPLETED

  FILE  BT,BV          USED   193  GRANULES

  FILE  BT,X1          USED     0  GRANULES

  FILE  BT,X2          USED    14  GRANULES

  FILE  BT,X3          USED     2  GRANULES
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
  FILE  BT0X4          USED      2  GRANULES
  FILE  BT0X5          USED      3  GRANULES
  FILE  BT0X6          USED      0  GRANULES

END OF MAP
 PAU  SYC
 R0V
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

CONTROLLER NUMBER	CONT TYPE	START PHASE-INT NO A	B	C	END PHASE-INT NO A	B	C	ADJ INT NO A	B	C	MIN ADJ INT LENGTH A	B	C
1	0	1	3	0	2	4	0	1	3	0	.0	.0	.0
2	1	1	4	7	3	5	8	1	4	7	.0	.0	.0
3	0	1	4	0	2	5	0	1	4	0	.0	.0	.0
4	0	1	4	0	2	5	0	1	4	0	.0	.0	.0
5	0	1	4	0	3	6	0	1	4	0	.0	.0	.0
6	5	1	2	0	1	2	0	1	2	0	.0	.0	.0
7	0	1	3	0	2	4	0	1	3	0	.0	.0	.0
9	0	15	7	0	6	13	0	1	7	0	.0	.0	.0
10	1	1	7	4	3	9	6	1	7	4	.0	.0	.0
11	3	1	4	5	3	6	6	1	5	0	.0	.0	.0
12	0	1	3	0	2	4	0	1	3	0	.0	.0	.0
13	0	1	4	0	3	6	0	1	5	0	.0	.0	.0
14	2	1	5	1	4	6	2	1	5	0	.0	.0	.0
15	2	1	6	4	5	7	5	4	6	0	.0	.0	.0
16	2	9	6	1	5	8	2	1	6	0	.0	.0	.0
17	1	1	5	7	4	6	9	1	5	7	.0	.0	.0
18	0	1	3	0	2	4	0	1	3	0	.0	.0	.0
19	0	1	3	0	2	4	0	1	3	0	.0	.0	.0
20	0	1	13	0	4	15	0	1	13	0	.0	.0	.0
21	0	1	5	0	3	7	0	1	5	0	.0	.0	.0
22	0	1	3	0	2	4	0	1	3	0	.0	.0	.0
23	0	1	6	0	5	8	0	1	6	0	.0	.0	.0
24	2	15	8	14	7	11	3	4	8	0	4.0	.0	.0
25	5	1	2	0	1	2	0	1	2	0	.0	.0	.0
26	0	1	11	0	10	16	0	1	11	0	.0	.0	.0
27	0	14	9	0	8	13	0	1	9	0	.0	.0	.0
28	0	7	4	0	3	6	0	1	4	0	.0	.0	.0
29	2	1	7	1	5	9	3	2	8	0	7.0	10.0	.0
30	0	1	4	0	3	6	0	2	5	0	5.0	5.0	.0
31	2	1	11	4	6	15	9	4	11	0	3.0	.0	.0
32	0	1	4	0	3	8	0	2	4	0	8.0	.0	.0
33	0	1	5	3	2	6	4	1	5	3	.0	.0	.0
34	0	1	5	0	3	7	0	2	6	0	10.0	10.0	.0
35	0	1	3	0	2	4	0	1	3	0	.0	.0	.0
36	0	1	5	0	4	8	0	2	7	0	11.0	11.0	.0
37	1	1	7	10	6	8	16	1	7	10	.0	.0	.0
38	1	1	4	6	3	5	8	2	4	7	12.0	7.0	7.0
39	2	1	5	1	4	6	2	1	5	0	.0	.0	.0
40	0	1	4	0	3	6	0	2	5	0	6.0	14.0	.0
41	0	1	4	0	3	6	0	2	4	0	5.0	.0	.0
42	2	7	4	1	3	5	3	1	4	0	.0	.0	.0
43	0	1	3	0	2	4	0	1	3	0	.0	.0	.0
44	0	1	3	0	2	4	0	1	3	0	.0	.0	.0
45	0	1	4	0	3	5	0	1	4	0	.0	.0	.0
46	0	1	3	0	2	4	0	1	3	0	.0	.0	.0
47	0	1	6	0	4	8	0	2	7	0	12.0	7.0	.0
48	0	1	3	0	2	4	0	1	3	0	.0	.0	.0
49	0	1	3	0	2	4	0	1	3	0	.0	.0	.0

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

113	0	1	3	0	2	4	0	1	3	0	.0	.0	.0
114	0	1	4	0	3	6	0	2	5	0	4.0	9.0	.0
115	0	1	4	0	3	6	0	2	5	0	6.0	6.0	.0
116	0	1	4	0	3	6	0	2	5	0	5.0	5.0	.0
117	0	1	3	0	2	4	0	1	3	0	.0	.0	.0
118	0	1	4	0	3	6	0	2	5	0	5.0	5.0	.0
119	0	1	3	0	2	4	0	1	3	0	.0	.0	.0
120	0	1	4	0	3	6	0	1	4	0	.0	.0	.0
121	2	15	8	15	7	12	5	1	8	0	.0	.0	.0
122	5	1	2	0	1	2	0	1	2	0	.0	.0	.0
123	0	1	3	0	2	4	0	1	3	0	.0	.0	.0

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

CONT NO	LINK NO	LINK PHASE	START GRN INTERVAL	END AMBER INT	START AMBER INT	LINK DIR	MAJOR LINK
9	20	4	7	14	12	0	1
9	21	1	15	6	6	0	1
9	24	3	5	10	10	1	1
9	25	2	13	4	4	1	1
10	26	3	7	9	9	0	0
10	27	1	1	3	3	0	1
10	28	4	7	9	9	1	0
10	30	5	4	6	6	1	1
11	31	5	5	6	6	0	0
11	32	1	1	3	3	0	1
11	33	3	4	6	6	1	0
11	34	2	1	3	3	1	1
12	35	3	3	4	4	0	0
12	36	1	1	2	2	0	1
12	37	4	3	4	4	1	0
12	38	2	1	2	2	1	1
15	2	1	1	5	5	1	1
15	3	5	4	5	5	1	1
15	5	3	6	7	7	1	1
17	7	2	1	3	3	0	1
17	8	5	7	9	9	0	1
17	10	1	1	4	4	1	1
17	11	3	5	6	6	1	1
31	195	1	1	6	6	0	1
31	197	3	11	15	15	0	1
31	198	5	4	9	8	1	1
31	199	4	11	15	15	1	1
33	201	1	1	2	2	0	1
33	203	3	5	6	6	1	1
40	207	1	1	3	3	0	1
40	208	2	1	3	3	1	1
40	209	3	4	6	6	1	1
40	210	4	4	6	6	1	1
41	212	1	1	3	3	0	1
41	214	3	4	6	6	1	1
42	215	5	1	3	3	0	1
42	216	3	4	5	5	0	1
42	217	1	7	3	3	1	1
42	218	4	4	5	5	1	1
45	224	1	1	3	3	0	1
45	226	3	4	5	5	1	1
49	236	3	3	4	4	0	1
49	237	1	1	2	2	1	1
50	239	1	1	2	2	0	1
50	240	2	1	2	2	1	1
50	241	3	3	4	4	1	1
53	246	5	1	4	4	0	1
53	247	3	7	8	8	1	1

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

53	248	1	1	6	6	1	1
54	62	5	1	3	3	0	1
54	63	3	6	8	8	0	1
54	65	1	1	5	5	1	1
55	66	1	1	3	3	0	1
55	67	3	5	7	7	0	1
55	68	2	1	3	3	1	1
55	69	4	5	7	7	1	1
57	249	3	3	4	4	0	1
57	250	1	1	2	2	0	1
59	72	1	1	4	4	0	1
59	73	2	1	4	4	1	1
59	74	3	5	7	7	1	1
60	75	1	1	5	5	0	1
60	77	2	1	5	5	1	1
61	79	3	4	5	5	0	1
61	80	1	1	3	3	1	1
64	82	1	1	4	4	0	1
66	88	1	16	5	5	0	1
66	89	5	1	3	3	1	1
66	90	3	8	16	16	1	1
68	93	3	6	8	8	0	1
68	95	1	1	5	5	0	1
69	98	1	1	3	3	0	1
69	99	3	6	8	8	0	1
70	104	1	1	3	3	1	1
70	105	3	6	8	8	1	1
72	108	1	1	3	3	0	1
72	109	2	1	3	3	1	1
72	110	3	4	5	5	1	1
73	111	1	1	3	3	0	1
73	112	3	4	5	5	0	1
73	114	2	1	3	3	1	1
76	124	3	5	8	8	1	1
76	125	1	1	4	4	1	1
77	127	1	1	3	3	0	1
77	129	3	4	6	6	1	1
82	135	1	1	3	3	0	1
82	137	3	4	6	6	1	1
82	138	2	1	3	3	1	1
84	146	3	4	6	6	1	1
84	147	1	1	3	3	1	1
85	149	1	1	4	4	0	1
85	151	3	5	8	8	1	1
86	153	1	5	7	7	1	1
87	154	1	1	3	3	0	1
87	157	3	4	5	5	1	1
88	158	1	1	3	3	0	1
88	159	5	4	6	6	0	1
88	160	2	1	3	3	1	1
88	161	3	4	8	8	1	1
89	163	3	3	5	5	0	1
89	164	1	1	2	2	1	1

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

91	168	1	1	3	0	3	1
91	170	3	4	6	1	6	1
93	171	1	1	3	0	3	1
93	173	5	7	9	0	9	1
93	174	3	4	6	1	6	1
94	175	1	1	3	0	3	1
94	177	3	4	6	1	6	1
97	183	1	1	4	0	4	1
97	184	3	5	7	1	7	1
97	185	2	1	4	0	4	1
99	186	1	1	3	0	3	1
99	187	3	4	6	1	6	1
99	189	2	1	3	0	3	1
99	190	5	6	9	1	9	1
100	191	1	1	2	0	2	1
100	192	3	3	4	0	4	1
100	194	4	4	4	1	4	1
115	252	1	1	3	0	3	1
115	253	3	4	6	1	6	1
120	39	3	4	6	1	6	1
120	40	1	1	3	0	3	1
120	41	4	4	6	1	6	1
120	42	2	1	3	0	3	1
121	43	3	8	14	1	14	1
121	44	1	15	7	0	7	1
121	45	4	8	12	1	12	1
121	46	5	15	5	1	5	1
123	47	1	1	2	0	2	1
123	48	3	3	4	1	4	1
123	49	2	1	2	1	2	1

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

DIAL NO 6

CONT NO	CYCLE SEC	DIAL NO	INTERVAL LENGTH = SECS 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	80.	6	61.0	4.0	11.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2	80.	6	45.0	2.0	4.0	11.0	4.0	4.0	6.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
3	80.	6	59.5	4.0	1.5	5.0	6.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
4	80.	6	55.5	4.0	1.5	13.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
5	80.	6	7.0	46.0	4.0	7.0	12.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6	80.	6	46.0	34.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
7	80.	6	53.0	4.0	19.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9	80.	6	13.5	5.0	2.0	4.0	1.5	4.0	24.0	7.0	2.0	4.0	3.0	1.5	1.5	1.5	1.5	4.0
10	80.	6	15.0	4.0	4.0	28.0	4.0	4.0	8.0	9.0	4.0	.0	.0	.0	.0	.0	.0	.0
11	80.	6	44.0	2.0	2.0	15.0	13.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12	80.	6	55.0	4.0	17.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13	80.	6	58.5	2.0	4.0	1.5	10.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
14	80.	6	54.5	4.0	1.5	4.0	12.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
15	80.	6	21.0	2.0	4.0	35.0	4.0	8.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0
16	80.	6	25.0	4.0	8.0	15.0	4.0	6.0	7.0	4.0	7.0	.0	.0	.0	.0	.0	.0	.0
17	80.	6	18.0	10.0	4.0	4.0	20.0	4.0	8.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0
18	80.	6	55.0	4.0	17.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19	80.	6	44.0	4.0	28.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20	80.	6	9.0	2.0	4.0	4.0	4.0	4.0	5.0	2.0	6.0	2.0	4.0	4.0	9.0	13.0	4.0	4.0
21	80.	6	37.0	2.0	4.0	1.5	19.0	11.0	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0
22	80.	6	21.0	4.0	51.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
23	80.	6	7.0	6.0	4.0	34.0	4.0	7.5	12.0	4.0	1.5	.0	.0	.0	.0	.0	.0	.0
24	80.	6	7.0	2.0	4.0	12.0	2.0	2.0	4.0	9.0	2.0	2.0	3.0	3.0	4.0	4.0	18.0	2.0
25	80.	6	46.0	34.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
26	80.	6	14.0	2.0	4.0	12.0	4.0	4.0	6.5	4.0	5.5	4.0	4.0	3.0	2.0	4.0	5.0	2.0
27	80.	6	14.0	2.0	4.0	12.0	4.0	5.5	6.5	4.0	7.5	2.0	3.5	2.0	2.0	5.0	2.0	4.0
28	80.	6	25.0	16.0	4.0	12.0	12.0	4.0	3.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
29	80.	6	7.0	37.0	4.0	4.5	4.0	1.5	7.0	11.0	4.0	.0	.0	.0	.0	.0	.0	.0
30	80.	6	7.0	41.0	4.0	7.0	17.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
31	80.	6	6.0	2.0	2.0	8.0	2.0	4.0	19.5	2.0	2.0	1.5	19.5	2.0	2.0	2.0	4.0	1.5
32	80.	6	7.0	35.0	4.0	7.0	4.0	7.0	12.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
33	80.	6	37.0	4.0	15.0	4.0	16.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
34	80.	6	7.0	33.5	4.0	1.5	7.0	21.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0
35	80.	6	42.0	4.0	30.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
36	80.	6	7.0	25.0	2.0	4.0	7.0	11.0	20.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
37	80.	6	8.5	9.0	11.0	4.0	4.0	4.0	4.0	4.0	1.5	1.5	4.0	3.5	4.0	11.0	2.0	4.0
38	80.	6	7.0	28.0	4.0	7.0	4.0	7.0	19.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
39	80.	6	37.0	4.0	16.0	4.0	15.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
40	80.	6	7.0	35.0	4.0	7.0	23.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
41	80.	6	7.0	25.0	4.0	38.0	2.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
42	80.	6	18.0	2.0	4.0	32.5	4.0	1.5	14.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
43	80.	6	17.0	4.0	55.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
44	80.	6	23.0	4.0	49.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
45	80.	6	47.0	2.0	4.0	21.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
46	80.	6	30.0	4.0	42.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
47	80.	6	7.0	41.5	2.0	4.0	1.5	7.0	13.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
48	80.	6	44.0	4.0	28.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

49	80.	6	64.0	4.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
50	80.	6	35.0	4.0	37.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
51	80.	6	57.0	4.0	15.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
52	80.	6	48.0	4.0	24.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
53	80.	6	17.0	4.0	2.0	4.0	14.0	4.0	31.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
54	80.	6	7.0	21.0	4.0	7.0	4.0	7.0	26.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
55	80.	6	7.0	25.5	4.0	1.5	7.0	28.0	4.0	1.5	1.5	.0	.0	.0	.0	.0	.0	.0
56	80.	6	7.0	45.0	4.0	7.0	13.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
57	80.	6	63.0	4.0	9.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
58	80.	6	57.0	23.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
59	80.	6	7.0	35.5	7.0	4.0	10.0	11.0	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0
60	80.	6	10.0	18.0	2.0	7.0	4.0	7.0	26.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0
61	80.	6	43.5	2.0	4.0	24.0	4.0	2.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
62	80.	6	45.0	2.0	4.0	10.0	15.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
63	80.	6	7.0	30.0	8.0	4.0	7.0	12.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
64	80.	6	7.0	29.0	8.0	4.0	7.0	13.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
65	80.	6	7.0	19.0	4.0	7.0	11.0	4.0	7.0	17.0	4.0	.0	.0	.0	.0	.0	.0	.0
66	80.	6	7.0	21.0	4.0	8.0	4.0	4.0	4.0	7.0	5.0	2.0	2.0	2.0	2.0	2.0	2.0	4.0
67	80.	6	7.0	1.5	27.5	4.0	7.0	21.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
68	80.	6	7.0	15.0	4.0	7.0	4.0	7.0	30.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0
69	80.	6	7.0	31.0	4.0	7.0	4.0	7.0	16.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
70	80.	6	7.0	28.0	4.0	7.0	4.0	7.0	17.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0
71	80.	6	15.0	4.0	4.0	4.0	7.0	10.0	2.0	2.0	2.0	2.0	4.0	1.5	4.0	9.5	4.0	5.0
72	80.	6	51.0	2.0	4.0	16.5	4.0	2.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
73	80.	6	35.0	2.0	4.0	33.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
74	80.	6	7.0	38.0	2.0	4.0	7.0	1.5	16.5	4.0	.0	.0	.0	.0	.0	.0	.0	.0
75	80.	6	7.0	18.0	4.0	13.0	4.0	7.0	20.5	5.0	1.5	.0	.0	.0	.0	.0	.0	.0
76	80.	6	7.0	29.0	2.0	4.0	7.0	9.0	18.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
77	80.	6	7.0	36.0	4.0	7.0	22.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
81	80.	6	7.0	22.0	4.0	7.0	36.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
82	80.	6	7.0	37.0	4.0	7.0	21.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
83	80.	6	7.0	36.0	4.0	7.0	22.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
84	80.	6	7.0	18.0	4.0	7.0	40.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
85	80.	6	7.0	17.0	2.0	4.0	7.0	31.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
86	80.	6	7.0	36.0	2.0	4.0	7.0	18.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0
87	80.	6	51.0	2.0	4.0	17.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
88	80.	6	7.0	30.0	4.0	7.0	13.0	4.0	9.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0
89	80.	6	40.0	4.0	10.0	20.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
90	80.	6	7.0	26.0	8.0	4.0	7.0	8.0	12.0	4.0	4.0	.0	.0	.0	.0	.0	.0	.0
91	80.	6	7.0	14.0	4.0	7.0	12.0	4.0	7.0	21.0	4.0	.0	.0	.0	.0	.0	.0	.0
93	80.	6	7.0	24.0	4.0	7.0	11.0	4.0	7.0	12.0	4.0	.0	.0	.0	.0	.0	.0	.0
94	80.	6	7.0	34.0	4.0	7.0	24.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
96	80.	6	7.0	37.0	4.0	7.0	21.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
97	80.	6	7.0	33.0	2.0	4.0	7.0	21.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0
99	80.	6	7.0	25.0	4.0	12.0	4.0	4.0	10.0	10.0	4.0	.0	.0	.0	.0	.0	.0	.0
100	80.	6	43.0	4.0	29.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
103	80.	6	59.0	4.0	5.0	6.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
104	80.	6	36.0	14.0	2.0	4.0	4.0	8.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
105	80.	6	40.0	17.0	4.0	7.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
106	80.	6	24.0	2.0	10.5	2.0	2.0	4.0	1.5	4.0	3.0	3.0	7.0	4.0	2.0	4.0	3.0	4.0
109	80.	6	39.0	4.0	4.0	7.0	18.5	2.0	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0
110	80.	6	7.0	37.0	4.0	8.0	4.0	7.0	9.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
111	40.	6	7.0	10.5	2.0	4.0	1.5	7.0	4.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

112	80.	6	25.0	9.0	2.0	4.0	4.0	16.0	16.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
113	80.	6	55.0	4.0	17.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
114	80.	6	7.0	47.0	4.0	7.0	11.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
115	80.	6	7.0	51.0	4.0	7.0	7.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
116	80.	6	7.0	50.0	4.0	7.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
117	80.	6	57.0	4.0	15.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
118	80.	6	7.0	51.0	4.0	7.0	7.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
119	80.	6	20.0	4.0	12.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
120	80.	6	42.0	10.0	4.0	10.0	10.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
121	80.	6	11.5	4.0	10.0	5.0	4.0	8.0	4.0	9.0	2.0	5.0	2.0	4.0	2.0	4.0	1.5	4.0
122	80.	6	56.0	24.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
123	80.	6	57.0	4.0	15.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

DIAL NUMBER 6

CONT NO	TKMIN	SUMA	SUMB	SUMC	SUMTOT	GAMIN	GBMIN	GCMIN	GAB	GBC	GABC
1	46.0	4.0	4.0	.0	.0	35.0	11.0	.0	80.0	.0	.0
2	54.0	6.0	4.0	4.0	4.0	29.0	11.0	10.0	66.0	.0	76.0
3	51.0	4.0	6.0	.0	5.5	34.5	11.0	.0	74.5	.0	.0
4	47.0	4.0	4.0	.0	3.0	32.5	11.5	.0	77.0	.0	.0
5	80.0	50.0	16.0	.0	.0	57.0	23.0	.0	80.0	.0	.0
7	42.0	4.0	4.0	.0	.0	31.0	11.0	.0	80.0	.0	.0
9	62.0	22.0	19.0	.0	1.5	29.5	31.0	.0	78.5	.0	.0
10	57.0	8.0	13.0	8.0	.0	15.0	20.0	22.0	44.0	.0	80.0
11	52.0	4.0	19.0	11.0	.0	26.0	26.0	.0	80.0	65.0	.0
12	43.0	4.0	4.0	.0	.0	32.0	11.0	.0	80.0	.0	.0
13	48.0	6.0	5.5	.0	.0	35.5	12.5	.0	80.0	.0	.0
14	48.0	9.5	4.0	31.5	.0	37.0	11.0	.0	80.0	74.5	.0
15	62.0	31.0	4.0	22.0	1.5	48.0	11.5	.0	78.5	51.5	.0
16	68.0	38.0	11.0	17.0	.0	51.0	17.0	.0	80.0	46.0	.0
17	56.0	18.0	4.0	12.0	.0	25.0	12.0	19.0	60.0	.0	80.0
18	43.0	4.0	4.0	.0	.0	32.0	11.0	.0	80.0	.0	.0
19	44.0	4.0	4.0	.0	.0	26.0	18.0	.0	80.0	.0	.0
20	76.0	10.0	17.0	.0	35.0	17.0	24.0	.0	45.0	.0	.0
21	50.0	6.0	15.0	.0	3.0	25.0	22.0	.0	77.0	.0	.0
22	43.0	4.0	4.0	.0	.0	13.0	30.0	.0	80.0	.0	.0
23	80.0	48.0	16.0	.0	1.5	55.0	23.5	.0	78.5	.0	.0
24	70.0	41.0	7.0	29.0	11.0	45.0	14.0	.0	69.0	53.0	.0
26	73.0	46.0	16.0	.0	.0	53.0	20.0	.0	80.0	.0	.0
27	73.0	49.0	9.5	.0	.0	56.0	17.0	.0	80.0	.0	.0
	.0	2 .0	1 .0	.0	.0	40.0	.0	.0	80.0	.0	.0

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

50	45.0	4.0	4.0	.0	.0	22.0	23.0	.0	80.0	.0	.0
51	44.0	4.0	4.0	.0	.0	33.0	11.0	.0	80.0	.0	.0
52	44.0	4.0	4.0	.0	.0	28.0	16.0	.0	80.0	.0	.0
53	67.0	41.0	4.0	29.0	.0	47.0	20.0	.0	80.0	42.0	.0
54	54.0	22.0	11.0	17.0	.0	28.0	26.0	.0	80.0	49.0	.0
55	50.5	11.0	11.0	.0	4.5	21.0	25.0	.0	75.5	.0	.0
56	42.0	11.0	11.0	.0	.0	18.0	24.0	.0	80.0	.0	.0
57	47.0	4.0	4.0	.0	.0	36.0	11.0	.0	80.0	.0	.0
59	78.0	46.5	14.0	.0	1.5	53.5	23.0	.0	78.5	.0	.0
60	50.0	23.0	11.0	.0	1.5	24.5	24.0	.0	78.5	.0	.0
61	47.0	6.0	4.0	.0	2.5	28.5	16.0	.0	77.5	.0	.0
62	55.0	6.0	19.0	.0	.0	29.0	26.0	.0	80.0	.0	.0
63	41.0	19.0	19.0	.0	.0	20.5	20.5	.0	80.0	.0	.0
64	42.0	19.0	19.0	.0	.0	21.0	21.0	.0	80.0	.0	.0
65	69.0	11.0	11.0	.0	27.0	22.0	20.0	16.0	52.0	.0	.0
66	63.0	23.0	23.0	16.0	8.0	28.0	27.0	4.0	72.0	60.0	.0
67	43.0	12.5	19.0	.0	.0	22.5	20.5	.0	80.0	.0	.0
68	52.5	22.0	11.0	.0	1.5	28.0	23.0	.0	78.5	.0	.0
69	50.5	11.0	11.0	.0	11.0	12.5	27.0	.0	69.0	.0	.0
70	50.0	11.0	11.0	.0	12.5	12.5	25.0	.0	67.5	.0	.0
71	72.0	36.0	19.0	21.0	.0	45.0	27.0	.0	80.0	56.0	.0
72	46.0	6.0	4.0	.0	2.5	32.0	11.5	.0	77.5	.0	.0
73	47.0	6.0	4.0	.0	1.5	24.0	21.5	.0	78.5	.0	.0
74	44.0	13.0	27.5	.0	.0	15.0	29.0	.0	80.0	.0	.0
75	54.5	11.0	12.0	4.0	1.5	21.0	19.0	13.0	61.5	.0	78.5
76	50.5	13.0	29.0	.0	.0	20.0	30.5	.0	80.0	.0	.0
77	38.0	11.0	11.0	.0	.0	19.0	19.0	.0	80.0	.0	.0
81	40.0	11.0	11.0	.0	.0	19.0	21.0	.0	80.0	.0	.0
82	40.0	11.0	11.0	.0	.0	19.0	21.0	.0	80.0	.0	.0
83	40.0	11.0	11.0	.0	.0	19.0	21.0	.0	80.0	.0	.0
84	35.0	11.0	11.0	.0	.0	19.0	16.0	.0	80.0	.0	.0
85	39.5	13.0	19.0	.0	.0	19.0	20.5	.0	80.0	.0	.0
86	43.5	11.0	13.0	.0	1.5	23.0	19.0	.0	78.5	.0	.0
87	45.0	6.0	4.0	.0	1.5	32.0	11.5	.0	78.5	.0	.0
88	60.0	11.0	24.5	23.0	1.5	22.0	36.5	.0	78.5	65.0	.0
89	49.5	4.0	14.0	.0	1.5	24.0	24.0	.0	78.5	.0	.0
90	49.0	19.0	23.0	.0	4.0	20.5	24.5	.0	76.0	.0	.0
91	52.0	11.0	11.0	.0	19.0	16.0	17.0	8.0	48.0	.0	.0
93	45.0	11.0	11.0	11.0	.0	15.0	15.0	15.0	57.0	.0	80.0
94	31.0	11.0	11.0	.0	.0	15.0	16.0	.0	80.0	.0	.0
96	32.0	11.0	11.0	.0	.0	16.0	16.0	.0	80.0	.0	.0
97	39.5	13.0	11.0	.0	1.5	18.0	20.0	.0	78.5	.0	.0
99	61.0	11.0	34.0	19.0	.0	26.0	35.0	.0	80.0	64.0	.0
100	45.0	4.0	4.0	.0	.0	26.0	19.0	.0	80.0	.0	.0
103	51.0	4.0	10.5	.0	1.5	34.0	19.5	.0	78.5	.0	.0
104	61.0	20.0	16.0	.0	10	38.0	23.0	.0	80.0	.0	.0
105	60.0	21.0	12.0	.0	.0	41.0	19.0	.0	80.0	.0	.0
106	68.0	27.5	14.0	4.0	5.5	39.5	17.0	6.0	68.5	.0	74.5
109	53.5	4.0	13.0	.0	5.5	24.0	24.0	.0	74.5	.0	.0
110	47.0	23.0	11.0	16.0	.0	28.0	19.0	.0	80.0	68.0	.0
111	31.5	13.0	11.0	.0	1.5	15.0	15.0	.0	38.5	.0	.0
112	59.0	15.0	20.0	.0	4.0	28.0	27.0	.0	76.0	.0	.0
113	43.0	4.0	4.0	.0	.0	32.0	11.0	.0	80.0	.0	.0

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

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 .0    11.0    11.0    .0      .0      15.0    20.0    .0      80.0    .0      .0
 34.0  .11.0   11.0    .0      .3      17.0    17.0    .0      80.0    .0      .0
 32.0  11.0    11.0    .0      .0      16.0    16.0    .0      80.0    .0      .0
 44.0  4.0     4.0     .0      .0      33.0    11.0    .0      80.0    .0      .0
 32.0  11.0    11.0    .0      .0      16.0    16.0    .0      80.0    .0      .0
 23.0  4.0     4.0     .0      .0      12.0    11.0    .0      40.0    .0      .0
 56.0  14.0    14.0    .0      .0      35.0    21.0    .0      80.0    .0      .0
 74.0  40.5    13.0    36.0    6.0     48.0    20.0    .0      74.0    62.0    .0
 44.0  4.0     4.0     .0      .0      33.0    11.0    .0      80.0    .0      .0
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FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

DIAL NUMBER 6

CONT NO	OK A1	OK AP	OK B1	OK B2	OK C1	MAX EXTENSIONS 1	2	3	4	GU A	B	C	GL A	B	C	BUS LINK PERIODS 1	2	3	4
9	2	2	2	2	0	6.	6.	10.	10.	28.	34.	0.	21.	26.	0.	30.	28.	37.	39.
10	2	0	1	1	2	8.	0.	0.	10.	18.	17.	29.	14.	13.	22.	18.	16.	16.	31.
11	2	2	1	0	1	10.	10.	6.	6.	38.	26.	14.	29.	19.	10.	45.	45.	27.	12.
12	2	2	1	1	0	10.	10.	10.	10.	47.	17.	0.	35.	13.	0.	54.	54.	16.	16.
15	2	0	2	0	2	10.	0.	10.	0.	53.	10.	31.	40.	7.	23.	61.	7.	34.	0.
17	2	2	2	0	2	10.	10.	10.	0.	29.	19.	16.	22.	14.	12.	31.	27.	19.	15.
31	2	0	2	2	2	5.	10.	10.	5.	19.	24.	30.	14.	18.	23.	19.	25.	25.	32.
33	2	0	2	0	0	10.	9.	0.	0.	33.	16.	15.	25.	12.	11.	36.	15.	0.	0.
40	2	2	2	2	0	10.	10.	9.	9.	37.	27.	0.	28.	20.	0.	41.	41.	29.	29.
41	2	0	2	0	0	10.	10.	0.	0.	29.	35.	0.	22.	26.	0.	31.	39.	0.	0.
42	2	0	2	2	2	10.	10.	10.	10.	34.	29.	19.	25.	22.	14.	37.	31.	31.	19.
45	2	0	2	0	0	10.	10.	0.	0.	42.	20.	0.	32.	15.	0.	48.	21.	0.	0.
49	2	0	2	0	0	10.	0.	0.	0.	54.	10.	0.	41.	7.	0.	63.	7.	0.	0.
50	2	2	2	0	0	10.	10.	10.	0.	31.	33.	0.	23.	25.	0.	34.	34.	36.	0.
53	2	0	2	0	2	0.	10.	0.	0.	36.	28.	22.	27.	21.	16.	40.	30.	22.	0.
54	2	0	2	0	2	10.	10.	10.	0.	34.	30.	26.	26.	22.	19.	38.	32.	27.	0.
55	2	2	2	2	0	10.	10.	10.	10.	29.	31.	0.	22.	23.	0.	31.	31.	34.	34.
57	2	0	2	0	0	10.	0.	0.	0.	54.	10.	0.	40.	8.	0.	62.	8.	0.	0.
59	2	2	2	0	0	0.	0.	0.	0.	43.	20.	0.	32.	15.	0.	49.	49.	20.	0.
60	2	2	0	0	0	10.	10.	0.	0.	33.	30.	0.	25.	23.	0.	36.	36.	0.	0.
61	2	0	2	0	0	10.	10.	0.	0.	40.	22.	0.	30.	17.	0.	45.	23.	0.	0.
64	2	0	0	0	0	10.	0.	0.	0.	38.	26.	0.	29.	19.	0.	43.	0.	0.	0.
66	2	0	2	0	2	10.	0.	10.	0.	35.	22.	26.	26.	17.	19.	43.	23.	27.	0.
68	2	0	2	0	0	9.	10.	0.	0.	30.	33.	0.	22.	25.	0.	32.	36.	0.	0.
69	2	0	2	0	0	10.	0.	0.	0.	34.	22.	0.	25.	16.	0.	37.	22.	0.	0.
70	2	0	2	0	0	10.	0.	0.	0.	31.	23.	0.	23.	17.	0.	34.	24.	0.	0.
72	2	2	2	0	0	10.	10.	9.	0.	46.	16.	0.	34.	12.	0.	52.	52.	15.	0.
73	2	2	2	0	0	10.	10.	10.	0.	33.	30.	0.	25.	23.	0.	36.	36.	32.	0.
76	2	0	2	0	0	10.	7.	0.	0.	34.	30.	0.	25.	23.	0.	37.	33.	0.	0.
77	2	0	2	0	0	10.	10.	0.	0.	38.	26.	0.	28.	20.	0.	42.	28.	0.	0.
82	2	2	2	0	0	10.	10.	10.	0.	38.	26.	0.	29.	19.	0.	43.	43.	27.	0.
84	2	0	2	0	0	10.	10.	0.	0.	23.	41.	0.	17.	31.	0.	24.	46.	0.	0.
85	2	0	2	0	0	10.	10.	0.	0.	24.	40.	0.	18.	30.	0.	25.	45.	0.	0.
86	2	0	0	0	0	7.	0.	0.	0.	24.	39.	0.	18.	29.	0.	25.	0.	0.	0.
87	2	0	2	0	0	10.	10.	0.	0.	46.	17.	0.	34.	13.	0.	52.	16.	0.	0.
88	2	2	2	0	2	10.	10.	0.	0.	33.	30.	19.	25.	23.	14.	36.	36.	32.	19.
89	2	0	2	0	0	10.	10.	0.	0.	35.	28.	0.	26.	21.	0.	39.	29.	0.	0.
91	2	0	2	0	0	9.	6.	0.	0.	20.	18.	0.	15.	14.	0.	20.	18.	0.	0.
93	2	0	2	0	2	10.	7.	8.	0.	28.	18.	18.	21.	13.	14.	30.	17.	18.	0.
94	2	0	2	0	0	10.	10.	0.	0.	36.	28.	0.	27.	21.	0.	40.	30.	0.	0.
97	2	2	2	0	0	10.	10.	10.	0.	37.	26.	0.	28.	19.	0.	41.	41.	27.	0.
99	2	2	2	0	2	10.	10.	9.	9.	29.	35.	22.	22.	26.	17.	31.	31.	39.	23.
100	2	0	2	2	0	10.	10.	10.	0.	38.	26.	0.	28.	20.	0.	42.	28.	28.	0.
115	2	0	2	0	0	10.	0.	0.	0.	50.	14.	0.	37.	11.	0.	57.	13.	0.	0.
120	2	2	1	1	0	10.	10.	0.	0.	45.	19.	0.	34.	14.	0.	51.	51.	19.	19.

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
121        2  0  1  1  2        0.   0.   0.   0.      42. 18. 32.      31. 13. 24.      47.  23.  17.  35.
123        2  2  1  0  0       10.  10.   8.   0.      49. 15.  0.      37. 11.  0.      56.  56.  14.   0.
```

CONTROLLER	OFFSET	CIC TOD FLAG
1	56.0	0
2	30.0	0
3	29.0	0
4	47.5	0
5	5.0	0
6	18.0	0
7	26.0	0
9	44.0	1
10	42.0	1
11	4.0	1
12	67.0	1
13	17.0	0
14	45.0	0
15	58.0	1
16	77.0	0
17	18.0	1
18	15.0	0
19	64.0	0
20	5.0	0
21	6.0	0
22	10.0	0
23	3.0	0
24	19.0	0
25	37.0	0
26	37.0	0
27	40.0	0
28	48.0	0
29	8.0	0
30	78.0	0
31	42.0	1
32	60.0	0
33	25.0	1
34	42.0	0
35	45.0	0
36	32.0	0
37	6.0	0
38	19.0	0
39	13.0	0
40	16.0	1
41	66.0	1
42	72.0	1
43	61.0	0
44	77.0	0
45	54.0	1
46	27.0	0
47	62.0	0
48	70.0	0
49	.0	1

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

50	32.0	1
51	56.0	0
52	54.0	0
53	61.0	1
54	61.0	1
55	29.0	1
56	24.0	0
57	59.0	1
58	58.0	0
59	70.0	1
60	13.0	1
61	3.0	1
62	65.0	0
63	29.0	0
64	35.0	1
65	42.0	1
66	38.0	1
67	26.0	0
68	.0	1
69	14.0	1
70	35.0	1
71	72.0	0
72	69.0	1
73	66.0	1
74	72.0	0
75	.0	0
76	22.0	1
77	35.0	1
81	53.0	0
82	74.0	1
83	11.0	0
84	69.0	1
85	2.0	1
86	42.0	1
87	2.0	1
88	39.0	0
89	50.0	0
90	69.0	0
91	2.0	0
93	77.0	1
94	64.0	1
96	29.0	0
97	37.0	1
99	2.0	1
100	70.0	1
103	22.0	0
104	29.0	0
105	16.0	0
106	4.0	0
109	51.0	0
110	66.0	0
111	58.0	0
112	46.0	0

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
                113          74.0            0
                114          59.0            0
                115          74.0            0
                116          32.0            0
                117          78.0            0
                118          18.0            0
                119          43.0            0
                120          16.0            1
                121          51.5            1
                122           .0             0
                123          77.0            1


                        PATTERN NUMBER 6      SECTION 1

01007004  08080000  46160000  A000005C  7A081608  00000000  00000000  00000000
0D002204  0C080000  47190000  A0000060  75040803  14080000  00000000  00000000
0E005A04  13083F00  4A160000  A0950060  6D080308  18080000  00000000  00000000
0F037404  3E082C03  62170000  9D67007C  2A040846  08110803  00000000  00000000
6A143E01  4F0F2F00  08080800  00000A0A  0A0A0A00  3D082200  14001400  10009A04
4C162200  66220000  A05C0088  3208101E  080C0E08  0E000000  00000000  11042404
24081800  32182A00  7800A070  24140808  28081010  08000000  00000000  3A262001
2B1D1800  08080800  08000A0A  0A0A0A00  1F1B130F  14141400  12001E04  08080000
40160000  A0000056  6E082208  00000000  00000000  00000000  13008004  08080000
34240000  A0000058  58083808  00000000  00000000  00000000  14000A04  14220046
22300000  5A000098  12040808  08080A04  0C040808  121A0808  15000C04  0C1E0006
322C0000  9A000064  4A040803  26160803  00000000  00000000  17000604  60200003
6E2F0000  90000A0  0E0C0844  080F1808  03000000  00000000  01DA04D0  02801AE0
039A1B20  03460880  01861AE0  00FE0312  01E00F90  039C05A1  01040240  027E0B80
00E408F3  02900A60  028603D0  00000000  02820660  02340E10  00CE028F  01E403D0
018603D0  01680A60  01840280  00A40147  019003D0  02400B80  03241470  00A8051E
019408F0

                        PATTERN NUMBER 6      SECTION 2

02003C04  0C080808  3A161400  8400986C  5A040816  08080C08  00000000  00000000
03003A04  080C000B  45160000  95000066  7708030A  0C080000  00000000  00000000
04005F04  08080006  41170000  9A00005E  6F080319  08030000  00000000  00000000
05000A04  64200000  722E0000  A00000A0  0E5C080E  18080000  00000000  00000000
06002404  00000000  00000000  00000000  5C440000  00000000  00000000  00000000
07003404  08080000  3F160000  A0000054  6A082608  00000000  00000000  00000000
09045804  2C260003  3B3E0000  9D00007C  1B0A0408  0308300E  04080603  03030308
39450001  28340000  08080000  08080A0A  0A0A0400  1F1C2627  0C0C1414  0A045404
101A1000  1E282C00  5800A072  1E080838  08081012  08000000  00000000  25223A01
1C192B00  08040800  0C040A0A  0A0A0A00  1210101F  10000014  08040804  08261600
34340000  A0820068  5804041E  1A080000  00000000  00000000  4D331B01  3A261400
08040400  08000A0A  0A0A0A00  2D2D1B0C  14140C0C  0C048604  08080000  40160000
A0000056  6E082208  00000000  00000000  00000000  5E220001  47190000  08040000
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
08040A0A 0A0A0A00 36361010 14141414 16001404 08080000 1A3C0000 A0000056
2A086608 00000000 00000000 00000000 67002C04 08150003 441F0000 9D000066
76080A0D 08030000 00000000 00000000 68003A04 28200000 4C2E0000 00000078
481C0408 08101008 00000000 00000000 69002004 2A180000 52260000 A0000078
5022080E 10080000 00000000 00000000 6A000804 371C0808 4F220C00 89009588
30041504 04080308 06060E08 04080608 78042004 1C1C0000 462A0000 A0000070
54140814 14080000 00000000 00000000 5A260001 431D0000 08040000 08040A0A
0A0A0A00 33331313 14140000 79046704 511A480C 60280000 947C0094 1708140A
08100812 040A0408 04080308 53234001 3E1A3000 08040800 0004CA0A 0A0A0A00
2F171123 00000000 7A000004 00000000 00000000 00000000 70300000 00000000
00000000 00000000 78039A04 08080000 42160000 A0000058 72081E08 00000000
00000000 00000000 621E0001 49170000 08040000 08000A0A 0A0A0A00 38380E00
14141000 01860300 01680660 01840280 00A40147 019003D0 02400880 03241470
03A8051E 01940850 009E051E 01220280 023C0D90 006E08B4 012A0450 01E41470
02340300 009C07EF 02300700 008C08F5 00F80395 006C024D 02420660 0072028F
03460700 003C0307 018C07A0 01921700 027210A0 019E07A0 007003D7 01660300
00000000
```

PATTERN NUMBER 6 SECTION 3

```
18002604 520E3A16 5A1C0000 8A6A008C 0E040818 04040812 04040606 08082404
19004A04 00000000 00000000 00000000 5C440000 00000000 00000000 00000000
1A004A04 5C200000 6A280000 A0000092 1C040818 08080D08 0B080806 04080A04
18005004 62130000 70220000 A0000092 1C040818 080B0D08 0F040704 040A0408
36037A04 2C162200 3B340000 A08A006C 0E2A080E 080E3408 00000000 00000000
453B3301 342C2A00 08080800 00000A0A 0A0A0A00 26201B00 14141400 37043A04
16160009 2A320000 97000065 0E330803 0E380803 03000000 00000000 3A3E0001
2C2F0003 08080000 0B080A0A 0A0A0A00 20202222 14141414 38003004 16160000
24300003 A0000054 0E5A080E 1A080000 00000000 00000000 3B038C04 5D1C0003
6B2E0003 9D00009C 0E470E08 14160803 00000000 00000000 56280001 401E0000
08083003 08000A0A 0A0A0A00 31311400 00000000 3C021A04 2E160003 31300000
9D000064 1424040E 080E3508 03000000 00000003 423C0001 312D0000 08000000
08000A0A 0A0A0A00 24240000 14140000 30020604 0C080005 39200000 9B00005E
57040833 08050000 00000000 00000000 4F2D0301 39220000 08080000 00000A0A
0A0A0A03 2D170000 14140000 3E008204 0C260000 3A340000 A000006E 5A040814
1E080003 00000000 00000000 3F003A04 26260303 29290000 A0000052 0E3C1008
0E181008 00000000 00000000 40014604 26260000 2A2A0000 A0000054 0E3A1008
0E1A1008 00000000 00000000 4D330001 3A260000 08000000 00000A0A 0A0A0A00
2B000003 14000000 41005404 16160036 2C282000 68000088 0E26080E 16080E22
08003003 00000000 42034C04 2F2E2010 38360800 9078007E 0E2A0810 0808080E
0A040404 04040408 46203301 35222600 08080800 00000A0A 0A0A0A00 2B171B00
14001403 43003404 19260000 2D290000 A0000056 0E033708 0E2A1008 00000000
00300003 44020004 2C160003 382E0000 9D000069 0E1E080E 080E3D08 03000000
00000003 38420001 2C320000 08080000 00000A0A 0A0A0A00 20250000 12140000
45021C04 16160016 19360000 8A000065 0E3E080F 080F2008 0000C000 00000000
432B0001 32200000 08080000 00000A0A 0A0A0A00 25160000 14000003 46024604
16160019 19320000 87000064 0F380B0E 080F2308 03000000 00000000 3E2E0001
2F220003 08080000 00000A0A 0A0A0A00 22180300 14000000 47009004 48262A00
5A360003 A0700090 1E080808 0E140404 04040303 0813080A 48038A04 0CC80005
40170000 9B00005C 66040821 08050000 00000000 00000000 5B210001 44190000
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
08080000 08000A0A 0A0A0A00 34341000 14141200 49038404 0C080003 302B0000
9D00005E 46040843 08030000 00000000 00000000 423C0001 312D0000 08080000
08000A0A 0A0A0A00 24242100 14141400 4A009004 1A370000 1E3A0000 A0000058
0E4C0408 0E032108 00000000 00000000 4B000004 16180803 2A261A00 7B009D6D
0E240814 080E290A 03000000 00000000 4C022C04 1A3A0000 283D0000 A0000065
0E3A0408 0E122408 00000000 00000000 433D0001 322E0000 08080000 00000A0A
0A0A0A00 25210000 140F0000 4D024604 16160000 26260000 A000004C 0E480808
2C080000 00000000 00000000 48350001 38280000 08080000 00000A0A 0A0A0A00
2A1C0000 14140000 51006A04 16160000 262A0000 A0000050 0E2C080E 48080000
00000000 00000000 52039404 16160000 262A0000 A0000050 0E4A080E 2A080000
00000000 00000000 4D330001 3A260000 08080000 08000A0A 0A0A0A00 2B2B1B00
14141400 53001A04 16160000 262A0000 A0000050 0E480808 2C080000 00000000
00000000 54028A04 16160000 26200000 A0000046 0E240808 50080000 00000000
00000000 2E520001 233D0000 08080000 00000A0A 0A0A0A00 182E0000 14140000
55020404 1A260000 26290000 A000004F 0E220408 0E3E1008 00000000 00000000
30500001 243C0000 08080000 00000A0A 0A0A0A00 192D0000 14140000 56015404
161A0003 2E260000 9D000057 0E480408 0E250803 00000000 00000000 2F4E0001
233B0000 08000000 00000A0A 0A0A0A00 19000000 0D000000 57020404 0C080003
40170000 9D00005A 66040823 08030000 00000000 00000000 5B220001 441A0000
08080000 00000A0A 0A0A0A00 34110000 14140000 58044E04 16312E03 2C490000
9D820078 0E3C080E 1A081308 03000000 00000000 423C2600 312D1D00 08080800
08000A0A 0A0A0A00 24242113 14140000 59026404 081C0003 30300000 9D000063
50081429 08030000 00000000 00000000 46370000 35290000 08080000 00000A0A
0A0A0A00 271E0000 14140000 5A008A04 262E0008 29310000 98000062 0E341008
0E101808 08000000 00000000 5B020404 16160026 20221000 60000068 0E1C080E
18080E2A 08000000 00000000 28250000 1E1C0000 08080000 00000A0A 0A0A0A00
14120000 120C0000 5D039A04 16161600 1E1F1E00 7200A05A 0E30C80E 160808E8
08000000 00000000 38232501 2A1A1C00 08080800 00000A0A 0A0A0A00 1E111200
140E1000 5E028004 16160000 1E200000 A000003E 0E44080E 3008C000 00000000
00000000 48380001 362A0000 08080000 00000A0A 0A0A0A00 281E0000 14140000
60003A04 16160000 20200000 A0000040 0F4A080E 2A080000 00000000 00000000
61034A04 1A160003 24280000 9D00004F 0E420408 0E280803 00000000 00000000
4A340001 37270000 08080000 08000A0A 0A0A0A00 29291C00 14141400 63040404
16442600 34460000 A080007A 0E320818 08081414 08000000 00000000 3A462D01
2B352200 08080800 08000A0A 0A0A0A00 1F1F2717 14141212 6403BC04 08080000
34260000 A000005A 56083408 00000000 00000000 00000000 4B350001 38280000
08080000 00080A0A 0A0A0A00 2A1C1C00 14141400 014403D0 00A40147 01740B80
00B2028F 01940BF0 021608F0 007E051E 01840510 019C07A0 02820E10 01BE0B80
01C407A0 00F6028F 00640147 01920A30 029E0660 01E41330 018E0510 00000000
02320660 01D40A60 00000C00 02EA0E10 01E20510 02E41AE0 01560510 00000000
010E0CC0 01040A30 006E0147 018208F0 017007A0 012810A0 01C40510 02740660
01AC10A0 00000000 015E07A0 01500A30 00000000 01B80B80 025811E0 004C0147
00000000 00660CCC 00000000 01340B80 014008F0 019A0B80 02140660 016403D0
02BC0660 01740A30 01840BF0 01F40B80 01440280 02A00CC0 00000000 02E80660
029C0660 00D40147 01DC03D0 01B407E0 01460490 02800620 01B803D0 017004D0
02460970 01F60490 01C40930 01580310 016C0410 02640510 00560000 022A07A0
01440300 022A0510 00D0051E 00C40147 018E08F0 01C208F0 020E0510 017A03D0
018C03D0 020C0510 02180510 005C0147 017403D0 01D40510 022411E0 023608F0
01C00A30 01E60510 017403D0 02380510 01EC11E0 01CA0F50 00760147 02E607A0
011C0510 01E40A30 00DC0666 02F20E10 018E0660 01F20CC0 00F603D7 02A40A30
00560B8F 005C0147 01CC03D0 00840666 020E0510 00BC08F5 00960666 01260510
004E0666 01C408F0 01B407A0 00000000 017C0510 01760A30 019803D0 02060510
01EC0510 00000000 023C1470 019A0CC0 02C810A0 01E40E10 02FC0E10 01161C20
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
01C40510  017A0460  018C07A0  02081700  021807A0  005C0B85  017415C0 . 02000B80



                    PATTERN NUMBER 6      SECTION 4

1C006004  36200000  502E0000  A000007E  32200818  18080608  00000000  00000000
1D001004  27162403  352A0000  9D8C0062  0E4A0809  08030E16  08000000  00000000
1E009C04  16160000  20200000  A0000040  0E52080E  22080000  00000000  00000000
1F045404  20144135  26230000  6B86007E  0C040410  04082704  04032704  04040803
262F3C01  1D232000  08080800  00080A0A  0A0A0A00  13191921  0A14140A  20007804
16360000  26440000  A000006A  0E46080E  080F1808  03000000  00000000  21023204
08080016  2E160F00  7A00005A  4A081E08  20080000  00000000  00000000  42201E01
31181700  08080000  00000A0A  0A0A0A00  240F0000  14120000  22005404  16160006
2A2A0000  9A300056  0F43C803  0E2B0803  00000000  00000000  23005A04  08080000
32260000  A0000058  540C3C08  00000000  00000000  00000000  24004004  1A2C0000
30420000  A0000072  0F320408  0E162808  00000000  00000000  25000C04  40083903
4F103C00  61009096  11121608  08080808  03030807  08160408  26002604  16081600
2E162400  64004068  0F380806  080E2608  00000000  00000000  27001A04  30082E00
56160000  A078006C  4A082008  1F080000  00000000  00000000  28042004  16160000
22320000  A0000054  0E46080E  2E080000  00000000  00000000  4A360001  37290000
08080000  08080A0A  0A0A0A0C  29291D1D  14141212  29028404  160C0000  20320000
A0000052  0E320846  04080000  00000000  00000000  3A460001  28350000  08080000
0000DA0A  0A0A0A00  1F270000  14140000  2A049004  30081A03  3E290000  9D790068
24040841  08031C08  00000000  00000000  433A2601  322C1D00  08080800  00080A0A
0A0A0A00  25202013  14141414  2B007A04  08080000  16400000  A0000056  22086E08
00000000  00000000  00000000  2C009A04  08080000  1E3A0000  A000005B  2E086208
00000000  00000000  00000000  20026C04  0C080003  3C180000  9D00005A  5E040828
08030000  00000000  00000000  55290001  401F0000  08080000  00000A0A  0A0A0A00
30150000  14140000  2E003604  08080000  26320000  A0000058  3C085408  00000000
00000000  00000000  2F007C04  1A160003  32240000  9D000059  0E530408  030E1A08
00000000  00000000  30008C04  08080000  34240000  A0000058  580C3808  00000000
00000000  00000000  31020004  08080000  4B160000  A000005E  80081008  00000000
00000000  00000000  6D130001  520E0000  08080000  00000A0A  0A0A0A00  3F070000
14000000  32034004  08080000  2C2E0000  A000005A  46084A08  00000000  00000000
00000000  3E420001  2F310000  08080000  08000A0A  0A0A0A00  22222400  14141400
33007004  08080000  42160000  A0000058  72081E08  00000000  00000000  00000000
34006C04  08080000  38200000  A0000058  60083008  00000000  00000000  00000000
35037A04  52083A00  5E280000  A07C0086  22080408  1C083E08  00000000  00000000
48382801  362A2000  08080800  00000A0A  0A0A0A00  281E1600  00140000  39027604
08080000  48160000  A000005E  7E081208  00000000  00000000  00000000  6B150001
50100000  08080000  00000A0A  0A0A0A00  3E080000  14000000  3A007404  00000000
00000000  00000000  722F0000  00000000  00000000  00000000  6D006604  081A000B
30300000  95000068  4E080806  25040803  00000000  00000000  6F008404  2E162000
38260000  A0880056  0E4A0810  080E1208  00000000  00000000  6F007400  1A160003
1E1E0000  4D00003F  0E150408  030E0808  00000000  00000000  70005C04  1E280008
38360000  98000076  32120408  08202008  00000000  00000000  71009404  08080000
40160000  A0000056  6F082208  00000000  00000000  00000000  72007604  16160000
1E280000  A0000046  0E5E080E  16080000  00000000  00000000  73029404  16160000
22220000  A0000044  0E66080E  0F080000  00000000  00000000  63100000  4A160000
08080000  00000A0A  0A0A0A00  390D0000  14000000  74004004  16160000  20200000
A0000040  0E640806  10080000  00000000  00000000  75009C04  08080000  42160000
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

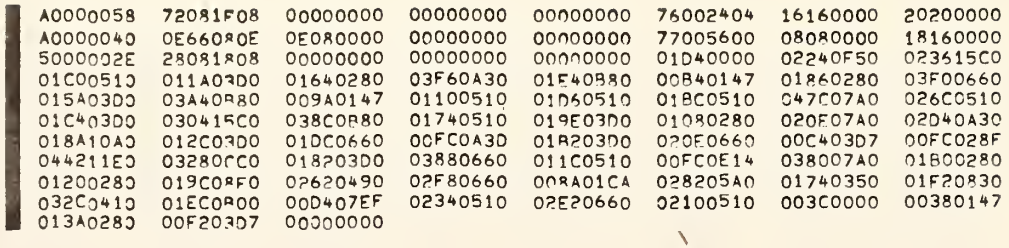

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

DIAL NO 7

CONT NO	CYCLE SEC	DIAL NO	INTERVAL LENGTH = SECS 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	80.	7	55.0	4.0	17.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2	80.	7	41.0	2.0	4.0	10.0	4.0	4.0	11.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
3	80.	7	59.5	4.0	1.5	5.0	6.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
4	80.	7	55.5	4.0	1.5	13.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
5	80.	7	49.0	4.0	4.0	8.0	11.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6	80.	7	48.0	32.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
7	80.	7	49.0	4.0	23.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9	80.	7	14.0	5.0	2.0	4.0	1.5	4.0	23.5	7.0	2.0	4.0	3.0	1.5	1.5	1.5	1.5	4.0
10	80.	7	16.0	4.0	4.0	27.0	4.0	4.0	8.0	9.0	4.0	.0	.0	.0	.0	.0	.0	.0
11	80.	7	34.0	2.0	4.0	24.0	12.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12	80.	7	52.0	4.0	20.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13	80.	7	60.0	2.0	4.0	1.5	8.5	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
14	80.	7	54.5	4.0	1.5	4.0	12.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
15	80.	7	16.0	2.0	4.0	37.0	4.0	11.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0
16	80.	7	26.0	4.0	16.0	6.0	4.0	7.0	7.0	4.0	6.0	.0	.0	.0	.0	.0	.0	.0
17	80.	7	19.0	10.0	4.0	4.0	20.0	4.0	6.0	9.0	4.0	.0	.0	.0	.0	.0	.0	.0
18	80.	7	55.0	4.0	17.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19	80.	7	56.0	4.0	16.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20	80.	7	9.0	2.0	4.0	4.0	4.0	4.0	6.0	2.0	5.0	2.0	4.0	4.0	9.0	13.0	4.0	4.0
21	80.	7	33.0	2.0	4.0	1.5	19.5	14.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0
22	80.	7	20.0	4.0	52.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
23	80.	7	7.0	6.0	4.0	36.0	4.0	5.5	12.0	4.0	1.5	.0	.0	.0	.0	.0	.0	.0
24	80.	7	11.0	2.0	4.0	12.0	2.0	2.0	4.0	8.0	2.0	2.0	3.0	3.0	4.0	4.0	15.0	2.0
25	80.	7	46.0	34.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
26	80.	7	14.0	2.0	4.0	12.0	4.0	4.0	6.5	4.0	5.5	4.0	4.0	3.0	2.0	4.0	5.0	2.0
27	80.	7	14.0	2.0	4.0	12.0	4.0	5.5	6.5	4.0	7.5	2.0	3.5	2.0	2.0	5.0	2.0	4.0
28	80.	7	35.0	11.0	4.0	7.0	12.0	4.0	3.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
29	80.	7	7.0	39.5	4.0	1.5	4.0	1.5	7.0	11.5	4.0	.0	.0	.0	.0	.0	.0	.0
30	80.	7	7.0	35.0	4.0	7.0	23.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
31	80.	7	5.0	2.0	2.0	3.0	2.0	4.0	19.0	2.0	2.0	1.5	26.0	2.0	2.0	2.0	4.0	1.5
32	80.	7	7.0	35.0	4.0	7.0	4.0	7.0	12.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
33	80.	7	28.0	4.0	24.0	4.0	16.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
34	80.	7	7.0	34.5	4.0	1.5	7.0	20.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0
35	80.	7	34.0	4.0	38.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
36	80.	7	7.0	15.0	2.0	4.0	7.0	11.0	30.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
37	80.	7	7.0	9.0	10.0	4.0	4.0	4.0	4.0	4.0	1.5	1.5	4.0	4.0	4.0	13.0	2.0	4.0
38	80.	7	7.0	36.0	4.0	7.0	4.0	7.0	11.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
39	80.	7	38.0	4.0	15.0	4.0	15.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
40	80.	7	7.0	37.0	4.0	7.0	21.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
41	80.	7	7.0	17.0	4.0	46.0	2.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
42	80.	7	18.0	2.0	4.0	34.5	4.0	1.5	12.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
43	80.	7	25.0	4.0	47.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
44	80.	7	27.0	4.0	45.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
45	80.	7	23.0	2.0	4.0	45.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
46	80.	7	30.0	4.0	42.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
47	80.	7	7.0	41.5	2.0	4.0	1.5	7.0	13.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
48	80.	7	44.0	4.0	28.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

49	80.	7	44.0	4.0	28.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
50	80.	7	46.0	4.0	26.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
51	80.	7	60.0	4.0	12.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
52	80.	7	47.0	4.0	25.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
53	80.	7	7.0	14.0	2.0	4.0	14.0	4.0	31.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
54	80.	7	7.0	21.0	4.0	7.0	4.0	7.0	26.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
55	80.	7	7.0	24.0	4.0	2.0	7.0	29.0	4.0	1.5	1.5	.0	.0	.0	.0	.0	.0	.0
56	80.	7	7.0	45.0	4.0	7.0	13.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
57	80.	7	56.0	4.0	16.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
58	80.	7	58.0	22.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
59	80.	7	7.0	28.0	7.0	4.0	10.0	18.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0
60	80.	7	10.0	25.0	2.0	7.0	4.0	7.0	19.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0
61	80.	7	36.0	2.0	4.0	31.5	4.0	2.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
62	80.	7	53.0	2.0	4.0	7.0	10.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
63	80.	7	7.0	31.0	8.0	4.0	7.0	11.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
64	80.	7	7.0	29.0	8.0	4.0	7.0	13.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
65	80.	7	7.0	20.0	4.0	7.0	11.0	4.0	7.0	16.0	4.0	.0	.0	.0	.0	.0	.0	.0
66	80.	7	7.0	21.0	4.0	9.0	4.0	4.0	4.0	7.0	4.0	2.0	2.0	2.0	2.0	2.0	2.0	4.0
67	80.	7	7.0	1.5	30.5	4.0	7.0	18.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
68	80.	7	7.0	15.0	4.0	7.0	4.0	7.0	30.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0
69	80.	7	7.0	24.0	4.0	7.0	4.0	7.0	23.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
70	80.	7	7.0	28.0	4.0	7.0	4.0	7.0	17.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0
71	80.	7	17.0	4.0	4.0	4.0	7.0	8.0	2.0	2.0	2.0	2.0	4.0	1.5	4.0	9.5	4.0	5.0
72	80.	7	42.0	2.0	4.0	25.5	4.0	2.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
73	80.	7	36.0	2.0	4.0	32.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
74	80.	7	7.0	28.0	2.0	4.0	7.0	1.5	26.5	4.0	.0	.0	.0	.0	.0	.0	.0	.0
75	80.	7	7.0	13.0	4.0	13.0	4.0	7.0	25.5	5.0	1.5	.0	.0	.0	.0	.0	.0	.0
76	80.	7	7.0	25.0	2.0	4.0	7.0	23.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
77	80.	7	7.0	25.0	4.0	7.0	33.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
81	80.	7	7.0	21.0	4.0	7.0	37.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
82	80.	7	7.0	37.0	4.0	7.0	21.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
83	80.	7	7.0	34.0	4.0	7.0	24.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
84	80.	7	7.0	34.0	4.0	7.0	24.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
85	80.	7	7.0	27.0	2.0	4.0	7.0	21.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
86	80.	7	7.0	24.0	2.0	4.0	7.0	30.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0
87	80.	7	42.0	2.0	4.0	26.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
88	80.	7	7.0	30.0	4.0	7.0	13.0	4.0	9.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0
89	80.	7	45.0	4.0	10.0	15.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
90	80.	7	7.0	25.0	8.0	4.0	7.0	9.0	12.0	4.0	4.0	.0	.0	.0	.0	.0	.0	.0
91	80.	7	7.0	14.0	4.0	7.0	12.0	4.0	7.0	21.0	4.0	.0	.0	.0	.0	.0	.0	.0
93	80.	7	7.0	21.0	4.0	7.0	15.0	4.0	7.0	11.0	4.0	.0	.0	.0	.0	.0	.0	.0
94	80.	7	7.0	34.0	4.0	7.0	24.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
96	80.	7	7.0	37.0	4.0	7.0	21.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
97	80.	7	7.0	34.0	2.0	4.0	7.0	20.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0
99	80.	7	7.0	28.0	4.0	12.0	4.0	4.0	7.0	10.0	4.0	.0	.0	.0	.0	.0	.0	.0
100	80.	7	44.0	4.0	28.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
103	80.	7	57.5	4.0	7.0	6.0	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
104	80.	7	36.0	14.0	2.0	4.0	4.0	8.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
105	80.	7	40.0	17.0	4.0	7.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
106	80.	7	16.0	2.0	12.0	2.0	2.0	4.0	1.5	4.0	8.0	4.0	7.5	4.0	2.0	4.0	3.0	4.0
109	80.	7	42.0	4.0	5.0	7.0	14.5	2.0	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0
110	80.	7	7.0	37.0	4.0	8.0	4.0	7.0	9.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
111	40.	7	7.0	10.5	2.0	4.0	1.5	7.0	4.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

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112    80.    7    25.0    9.0    2.0    4.0    4.0    16.0    16.0    4.0    .0    .0    .0    .0    .0    .0    .0    .0
113    80.    7    55.0    4.0    17.0   4.0    .0     .0      .0      .0     .0    .0    .0    .0    .0    .0    .0    .0
114    80.    7    7.0     47.0   4.0    7.0    11.0   4.0     .0      .0     .0    .0    .0    .0    .0    .0    .0    .0
115    80.    7    7.0     51.0   4.0    7.0    7.0    4.0     .0      .0     .0    .0    .0    .0    .0    .0    .0    .0
116    80.    7    7.0     50.0   4.0    7.0    8.0    4.0     .0      .0     .0    .0    .0    .0    .0    .0    .0    .0
117    80.    7    47.0    4.0    25.0   4.0    .0     .0      .0      .0     .0    .0    .0    .0    .0    .0    .0    .0
118    80.    7    7.0     49.0   4.0    7.0    9.0    4.0     .0      .0     .0    .0    .0    .0    .0    .0    .0    .0
119    40.    7    17.0    4.0    15.0   4.0    .0     .0      .0      .0     .0    .0    .0    .0    .0    .0    .0    .0
120    80.    7    42.0    10.0   4.0    10.0   10.0   4.0     .0      .0     .0    .0    .0    .0    .0    .0    .0    .0
121    80.    7    11.5    4.0    10.0   5.0    4.0    7.0     4.0     10.0   2.0   5.0   2.0   4.0   2.0   4.0   1.5   4.0
122    80.    7    56.0    24.0   .0     .0     .0     .0      .0      .0     .0    .0    .0    .0    .0    .0    .0    .0
123    80.    7    56.0    4.0    16.0   4.0    .0     .0      .0      .0     .0    .0    .0    .0    .0    .0    .0    .0
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FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

DIAL NUMBER 7

CONT NO	TKMIN	SUMA	SUMB	SUMC	SUMTOT	GAMIN	GBMIN	GCMIN	GAB	GBC	GABC
1	43.0	4.0	4.0	.0	.0	32.0	11.0	.0	80.0	.0	.0
2	53.0	6.0	4.0	4.0	4.0	27.0	11.0	11.0	61.0	.0	76.0
3	51.0	4.0	6.0	.0	5.5	34.5	11.0	.0	74.5	.0	.0
4	47.0	4.0	4.0	.0	3.0	32.5	11.5	.0	77.0	.0	.0
5	55.0	8.0	15.0	.0	.0	33.0	22.0	.0	80.0	.0	.0
7	44.0	4.0	4.0	.0	.0	29.0	15.0	.0	80.0	.0	.0
9	61.0	22.0	19.0	.0	1.5	29.0	30.5	.0	78.5	.0	.0
10	57.0	8.0	13.0	8.0	.0	15.0	20.0	22.0	45.0	.0	80.0
11	58.0	6.0	28.0	11.0	.0	23.0	35.0	.0	80.0	56.0	.0
12	42.0	4.0	4.0	.0	.0	30.0	12.0	.0	80.0	.0	.0
13	49.0	6.0	5.5	.0	.0	36.0	13.0	.0	80.0	.0	.0
14	48.0	9.5	4.0	31.5	.0	37.0	11.0	.0	80.0	74.5	.0
15	58.0	26.0	4.0	23.0	1.5	45.0	11.5	.0	78.5	56.5	.0
16	67.0	36.0	11.0	17.0	.0	49.0	18.0	.0	80.0	48.0	.0
17	56.0	18.0	4.0	13.0	.0	25.0	12.0	19.0	61.0	.0	80.0
18	43.0	4.0	4.0	.0	.0	32.0	11.0	.0	80.0	.0	.0
19	43.0	4.0	4.0	.0	.0	32.0	11.0	.0	80.0	.0	.0
20	76.0	10.0	17.0	.0	35.0	17.0	24.0	.0	45.0	.0	.0
21	52.0	6.0	18.5	.0	3.0	23.0	26.0	.0	77.0	.0	.0
22	42.0	4.0	4.0	.0	.0	12.0	30.0	.0	80.0	.0	.0
23	80.0	50.0	16.0	.0	1.5	57.0	21.5	.0	78.5	.0	.0
24	71.0	42.0	7.0	30.0	11.0	46.0	14.0	.0	69.0	53.0	.0
26	73.0	46.0	16.0	.0	.0	53.0	20.0	.0	80.0	.0	.0
27	73.0	49.0	9.5	.0	.0	56.0	17.0	.0	80.0	.0	.0
28	63.0	22.0	16.0	.0	.0	40.0	23.0	.0	80.0	.0	.0
29	46.0	16.5	11.0	18.0	1.5	23.5	21.0	.0	78.5	73.0	.0
30	32.0	11.0	11.0	.0	.0	16.0	16.0	.0	80.0	.0	.0
31	67.0	15.0	10.0	32.0	26.0	18.0	23.0	.0	54.0	68.0	.0
32	53.0	11.0	27.0	.0	.0	19.0	34.0	.0	80.0	.0	.0
33	45.0	4.0	4.0	.0	16.0	18.0	11.0	12.0	52.0	.0	.0
34	45.0	11.0	11.0	.0	3.0	21.0	21.0	.0	77.0	.0	.0
35	44.0	4.0	4.0	.0	.0	21.0	23.0	.0	80.0	.0	.0
36	57.0	13.0	22.0	.0	.0	24.0	33.0	.0	80.0	.0	.0
37	80.0	31.0	4.0	31.0	1.5	38.0	8.0	32.5	46.0	.0	78.5
38	52.0	11.0	4.0	11.0	.0	23.0	11.0	18.0	58.0	.0	80.0
39	53.0	23.0	4.0	23.0	.0	42.0	11.0	.0	80.0	61.0	.0
40	42.0	11.0	11.0	.0	.0	17.0	25.0	.0	80.0	.0	.0
41	45.0	11.0	6.0	.0	.0	16.0	29.0	.0	80.0	.0	.0
42	52.0	22.0	4.0	13.0	1.5	29.0	21.5	.0	78.5	62.5	.0
43	45.0	4.0	4.0	.0	.0	17.0	28.0	.0	80.0	.0	.0
44	45.0	4.0	4.0	.0	.0	18.0	27.0	.0	80.0	.0	.0
45	46.0	6.0	4.0	.0	1.5	17.0	27.5	.0	78.5	.0	.0
46	44.0	4.0	4.0	.0	.0	19.0	25.0	.0	80.0	.0	.0
47	44.5	13.0	11.0	.0	1.5	25.0	18.0	.0	78.5	.0	.0
48	44.0	4.0	4.0	.0	.0	26.0	18.0	.0	80.0	.0	.0
49	44.0	4.0	4.0	.0	.0	26.0	18.0	.0	80.0	.0	.0

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

50	44.0	4.0	4.0	.0	.0	27.0	17.0	.0	80.0	.0	.0
51	45.0	4.0	4.0	.0	.0	34.0	11.0	.0	80.0	.0	.0
52	45.0	4.0	4.0	.0	.0	28.0	17.0	.0	80.0	.0	.0
53	57.0	31.0	4.0	19.0	.0	37.0	20.0	.0	80.0	62.0	.0
54	54.0	22.0	11.0	17.0	.0	28.0	26.0	.0	80.0	69.0	.0
55	51.0	11.0	11.0	.0	5.0	21.0	25.0	.0	75.0	.0	.0
56	42.0	11.0	11.0	.0	.0	18.0	24.0	.0	80.0	.0	.0
57	43.0	4.0	4.0	.0	.0	32.0	11.0	.0	80.0	.0	.0
59	70.5	39.0	14.0	.0	1.5	46.0	23.0	.0	78.5	.0	.0
60	50.0	23.0	11.0	.0	1.5	24.5	24.0	.0	78.5	.0	.0
61	47.0	6.0	4.0	.0	2.5	24.0	20.5	.0	77.5	.0	.0
62	54.0	6.0	14.0	.0	.0	33.0	21.0	.0	80.0	.0	.0
63	41.0	19.0	19.0	.0	.0	20.5	20.5	.0	80.0	.0	.0
64	42.0	19.0	19.0	.0	.0	21.0	21.0	.0	80.0	.0	.0
65	69.0	11.0	11.0	.0	27.0	22.0	20.0	16.0	53.0	.0	.0
66	64.0	24.0	23.0	16.0	8.0	29.0	27.0	4.0	72.0	59.0	.0
67	43.0	12.5	19.0	.0	.0	22.5	20.5	.0	80.0	.0	.0
68	52.5	22.0	11.0	.0	1.5	28.0	23.0	.0	78.5	.0	.0
69	50.5	11.0	11.0	.0	11.0	12.5	27.0	.0	69.0	.0	.0
70	50.0	11.0	11.0	.0	12.5	12.5	25.0	.0	67.5	.0	.0
71	72.0	36.0	19.0	21.0	.0	45.0	27.0	.0	80.0	56.0	.0
72	47.0	6.0	4.0	.0	2.5	27.0	17.5	.0	77.5	.0	.0
73	46.0	6.0	4.0	.0	1.5	24.0	20.5	.0	78.5	.0	.0
74	54.0	13.0	37.5	.0	.0	15.0	39.0	.0	80.0	.0	.0
75	54.5	11.0	12.0	4.0	1.5	21.0	19.0	13.0	61.5	.0	78.5
76	40.5	13.0	19.0	.0	.0	20.0	20.5	.0	80.0	.0	.0
77	38.0	11.0	11.0	.0	.0	19.0	19.0	.0	80.0	.0	.0
81	40.0	11.0	11.0	.0	.0	19.0	21.0	.0	80.0	.0	.0
82	40.0	11.0	11.0	.0	.0	19.0	21.0	.0	80.0	.0	.0
83	40.0	11.0	11.0	.0	.0	19.0	21.0	.0	80.0	.0	.0
84	35.0	11.0	11.0	.0	.0	19.0	16.0	.0	80.0	.0	.0
85	39.5	13.0	19.0	.0	.0	19.0	20.5	.0	80.0	.0	.0
86	43.5	11.0	13.0	.0	1.5	23.0	19.0	.0	78.5	.0	.0
87	46.0	6.0	4.0	.0	1.5	27.0	17.5	.0	78.5	.0	.0
88	60.0	11.0	24.5	23.0	1.5	22.0	36.5	.0	78.5	65.0	.0
89	52.5	4.0	14.0	.0	1.5	27.0	24.0	.0	78.5	.0	.0
90	49.0	19.0	23.0	.0	4.0	20.5	24.5	.0	76.0	.0	.0
91	52.0	11.0	11.0	.0	19.0	16.0	17.0	8.0	48.0	.0	.0
93	45.0	11.0	11.0	11.0	.0	15.0	15.0	15.0	58.0	.0	80.0
94	31.0	11.0	11.0	.0	.0	15.0	16.0	.0	80.0	.0	.0
96	32.0	11.0	11.0	.0	.0	16.0	16.0	.0	80.0	.0	.0
97	39.5	13.0	11.0	.0	1.5	18.0	20.0	.0	78.5	.0	.0
99	61.0	11.0	34.0	19.0	.0	26.0	35.0	.0	80.0	64.0	.0
100	44.0	4.0	4.0	.0	.0	26.0	18.0	.0	80.0	.0	.0
103	52.0	4.0	10.0	.0	1.5	33.5	17.0	.0	78.5	.0	.0
104	61.0	20.0	16.0	.0	.0	38.0	23.0	.0	80.0	.0	.0
105	60.0	21.0	12.0	.0	.0	41.0	19.0	.0	80.0	.0	.0
106	70.0	29.0	15.5	4.0	5.5	36.0	22.5	6.0	68.5	.0	74.5
109	55.5	4.0	13.0	.0	6.5	25.0	24.0	.0	73.5	.0	.0
110	47.0	23.0	11.0	16.0	.0	28.0	19.0	.0	80.0	68.0	.0
111	31.5	13.0	11.0	.0	1.5	15.0	15.0	.0	38.5	.0	.0
112	59.0	15.0	20.0	.0	4.0	28.0	27.0	.0	76.0	.0	.0
113	43.0	4.0	4.0	.0	.0	32.0	11.0	.0	80.0	.0	.0

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
114   35.0   11.0   11.0    .0    .0   15.0   20.0    .0   80.0    .0    .0
115   34.0   11.0   11.0    .0    .0   17.0   17.0    .0   80.0    .0    .0
116   32.0   11.0   11.0    .0    .0   16.0   16.0    .0   80.0    .0    .0
117   45.0    4.0    4.0    .0    .0   28.0   17.0    .0   80.0    .0    .0
118   32.0   11.0   11.0    .0    .0   16.0   16.0    .0   80.0    .0    .0
119   22.0    4.0    4.0    .0    .0   11.0   11.0    .0   40.0    .0    .0
120   56.0   14.0   14.0    .0    .0   35.0   21.0    .0   80.0    .0    .0
121   73.0   39.5   13.0   36.0   6.0   47.0   20.0    .0   74.0   63.0    .0
123   43.0    4.0    4.0    .0    .0   32.0   11.0    .0   80.0    .0    .0
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

DIAL NUMBER 7

CONT NO	QK A1	QK A2	QK B1	QK B2	QK C1	MAX EXTENSIONS 1	2	3	4	GU A	B	C	GL A	B	C	BUS LINK PERIODS 1	2	3	4
9	2	2	2	2	0	7.	7.	10.	10.	29.	34.	0.	22.	25.	0.	31.	28.	37.	38.
10	2	0	1	1	2	9.	0.	0.	10.	19.	17.	28.	14.	13.	21.	19.	16.	16.	30.
11	2	2	1	0	1	10.	10.	5.	5.	32.	32.	13.	24.	24.	10.	35.	35.	35.	11.
12	2	2	1	1	0	10.	10.	10.	10.	45.	19.	0.	34.	14.	0.	51.	51.	19.	19.
15	2	0	2	0	2	10.	0.	10.	0.	50.	12.	33.	38.	9.	25.	58.	10.	36.	0.
17	2	2	2	0	2	10.	10.	10.	0.	30.	19.	15.	22.	14.	11.	32.	28.	19.	14.
31	2	0	2	2	2	0.	10.	10.	0.	14.	29.	26.	11.	22.	19.	13.	31.	31.	27.
33	2	0	2	0	0	10.	9.	0.	0.	26.	16.	22.	19.	12.	17.	27.	15.	0.	0.
40	2	2	2	2	0	10.	10.	7.	7.	38.	26.	0.	29.	19.	0.	43.	43.	27.	27.
41	2	0	2	0	0	10.	10.	0.	0.	22.	42.	0.	17.	31.	0.	23.	47.	0.	0.
42	2	0	2	2	2	10.	10.	10.	10.	32.	31.	19.	24.	23.	14.	35.	33.	33.	19.
45	2	0	2	0	0	10.	10.	0.	0.	23.	40.	0.	17.	30.	0.	24.	45.	0.	0.
49	2	0	2	0	0	10.	10.	0.	0.	38.	26.	0.	29.	19.	0.	43.	27.	0.	0.
50	2	2	2	0	0	10.	10.	10.	0.	40.	24.	0.	30.	18.	0.	45.	45.	25.	0.
53	2	0	2	0	2	8.	10.	8.	0.	36.	28.	22.	27.	21.	16.	40.	30.	22.	0.
54	2	0	2	0	2	10.	10.	10.	0.	34.	30.	26.	26.	22.	19.	38.	32.	27.	0.
55	2	2	2	2	0	10.	10.	10.	10.	28.	32.	0.	21.	24.	0.	30.	30.	35.	35.
57	2	0	2	0	0	10.	9.	0.	0.	48.	16.	0.	36.	12.	0.	55.	15.	0.	0.
59	2	2	2	0	0	0.	0.	10.	0.	37.	26.	0.	28.	19.	0.	41.	41.	27.	0.
60	2	2	0	0	0	10.	10.	0.	0.	38.	24.	0.	29.	18.	0.	43.	43.	0.	0.
61	2	0	2	0	0	10.	10.	0.	0.	34.	28.	0.	25.	21.	0.	37.	30.	0.	0.
64	2	0	0	0	0	10.	0.	0.	0.	38.	26.	0.	29.	19.	0.	43.	0.	0.	0.
66	2	0	2	0	2	10.	0.	10.	0.	36.	22.	26.	27.	16.	19.	44.	22.	27.	0.
68	2	0	2	0	0	9.	10.	0.	0.	30.	33.	0.	22.	25.	0.	32.	36.	0.	0.
69	2	0	2	0	0	10.	7.	0.	0.	28.	27.	0.	21.	20.	0.	30.	29.	0.	0.
70	2	0	2	0	0	10.	0.	0.	0.	31.	23.	0.	23.	17.	0.	34.	24.	0.	0.
72	2	2	2	0	0	10.	10.	10.	0.	38.	24.	0.	29.	18.	0.	43.	43.	25.	0.
73	2	2	2	0	0	10.	10.	10.	0.	34.	29.	0.	25.	22.	0.	37.	37.	31.	0.
76	2	0	2	0	0	10.	10.	0.	0.	30.	34.	0.	23.	25.	0.	33.	37.	0.	0.
77	2	0	2	0	0	10.	10.	0.	0.	29.	35.	0.	22.	26.	0.	31.	39.	0.	0.
82	2	2	2	0	0	10.	10.	10.	0.	38.	26.	0.	29.	19.	0.	43.	43.	27.	0.
84	2	0	2	0	0	10.	10.	0.	0.	36.	28.	0.	27.	21.	0.	40.	30.	0.	0.
85	2	0	2	0	0	10.	10.	0.	0.	32.	32.	0.	24.	24.	0.	35.	35.	0.	0.
86	2	0	0	0	0	10.	0.	0.	0.	33.	30.	0.	25.	22.	0.	36.	0.	0.	0.
87	2	0	2	0	0	10.	10.	0.	0.	38.	24.	0.	29.	18.	0.	43.	25.	0.	0.
88	2	2	2	0	2	10.	10.	0.	0.	33.	30.	19.	25.	23.	14.	36.	36.	32.	19.
89	2	0	2	0	0	10.	5.	0.	0.	39.	24.	0.	29.	18.	0.	44.	25.	0.	0.
91	2	0	2	0	0	9.	6.	0.	0.	20.	18.	0.	15.	14.	0.	20.	18.	0.	0.
93	2	0	2	0	2	10.	10.	7.	0.	26.	21.	18.	19.	16.	13.	27.	21.	17.	0.
94	2	0	2	0	0	10.	10.	0.	0.	36.	28.	0.	27.	21.	0.	40.	30.	0.	0.
97	2	2	2	0	0	10.	10.	10.	0.	38.	25.	0.	28.	19.	0.	42.	42.	26.	0.
99	2	2	2	0	2	10.	10.	6.	6.	31.	33.	20.	23.	25.	15.	34.	34.	36.	20.
100	2	0	2	2	0	10.	10.	10.	0.	38.	26.	0.	29.	19.	0.	43.	27.	27.	0.
115	2	0	2	0	0	10.	0.	0.	0.	50.	14.	0.	37.	11.	0.	57.	13.	0.	0.
120	2	2	1	1	0	10.	10.	0.	0.	45.	19.	0.	34.	14.	0.	51.	51.	19.	19.

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
121        2  0  1  1  2        0.   0.   0.   0.      41.  18.  32.      31.  14.  24.      46.  24.  18.  35.
123        2  2  1  0  0       10.  10.   9.   0.      48.  16.   0.      36.  12.   0.      55.  55.  15.   0.
```

CONTROLLER	OFFSET	CIC TOD FLAG
1	44.0	0
2	10.0	0
3	4.0	0
4	47.5	0
5	13.0	0
6	22.0	0
7	29.0	0
9	68.0	1
10	56.0	1
11	41.0	1
12	66.0	1
13	77.0	0
14	38.0	0
15	50.0	1
16	48.0	0
17	13.0	1
18	19.0	0
19	50.0	0
20	77.0	0
21	78.0	0
22	11.0	0
23	69.0	0
24	67.0	0
25	29.0	0
26	78.0	0
27	38.0	0
28	52.0	0
29	23.0	0
30	14.0	0
31	48.0	1
32	67.0	0
33	20.0	1
34	54.0	0
35	69.0	0
36	34.0	0
37	16.0	0
38	25.0	0
39	19.0	0
40	30.0	1
41	3.0	1
42	.0	1
43	62.0	0
44	75.0	0
45	56.0	1
46	19.0	0
47	58.0	0
48	74.0	0
49	6.0	1

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

50	30.0	1
51	59.0	0
52	50.0	0
53	64.0	1
54	43.0	1
55	.0	1
56	2.0	0
57	66.0	1
58	40.0	0
59	8.0	1
60	11.0	1
61	40.0	1
62	17.0	0
63	67.0	0
64	20.0	1
65	78.0	1
66	45.0	1
67	4.0	0
68	60.0	1
69	46.0	1
70	22.0	1
71	.0	0
72	69.0	1
73	.0	1
74	70.0	0
75	.0	0
76	15.0	1
77	37.0	1
81	2.0	0
82	78.0	1
83	19.0	0
84	40.0	1
85	58.0	1
86	74.0	1
87	43.0	1
88	77.0	0
89	78.0	0
90	10.0	0
91	18.0	0
93	11.0	71
94	62.0	1
96	27.0	0
97	41.0	1
99	75.0	1
100	5.0	1
103	30.0	0
104	16.0	0
105	72.0	0
106	79.0	0
109	55.0	0
110	56.0	0
111	58.0	0
112	45.0	0

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
                113          11.0            0
                114          78.0            0
                115          69.0            0
                116          21.0            0
                117           2.0            0
                118          26.0            0
                119          43.0            0
                120          19.0            1
                121          44.0            1
                122          61.0            0
                123          74.0            1


                        PATTERN NUMBER 7      SECTION 1

01005804  080800C0  40160000  A0000056  6E082208  00000000  00000000  00000000
0D009A04  0C080000  481A0000  A0000062  78040803  11080000  00000000  00000000
0E004C04  13083F00  4A160000  A0950060  6D080308  18080000  00000000  00000000
0F036404  34082F03  5A170000  9D710074  2004084A  08170803  00000000  00000000
65194201  4C133100  08080800  00000A0A  0A0A0A00  3A082400  14001400  10006004
48162200  62240000  A0600086  3408200C  080E0E08  0C000000  00000000  11041A04
24081A00  32182400  7A00A070  26140808  28080C12  08000000  00000000  3B261E01
2C101700  08080800  08000A0A  0A0A0A00  201C130E  14141400  12002604  08080000
40160000  A0000056  6E082208  00000000  00000000  00000000  13006404  08080000
40160000  A0000056  70082008  00000000  00000000  00000000  14009A04  14220046
22300000  5A000098  12040808  08080C04  0A040808  121A0808  15009C04  0C250006
2E340000  9A000068  42040803  271D0803  00000000  00000000  17008A04  64200003
722B0000  900000A0  0E0C0848  080B1808  03000000  00000000  028C0660  034023D0
04A023D0  03EE0CC0  021E2280  019008F0  02BB1470  012C0B80  01CC0660  044E1700
028A1700  036A0A30  051C08F0  00000000  05100CC0  02080CC0  010A03D0  03FA08F0
028E07A0  02120F10  025C0660  01F607A0  03C80A30  04741330  04881EB0  01520F50
02941850

                        PATTERN NUMBER 7      SECTION 2

02001404  0C080808  36161600  7A00986A  52040814  08081608  00000000  00000000
03000804  080C000B  45160000  95000066  7708030A  0C080000  00000000  00000000
04005F04  08080006  41170000  9A00005E  6F08031B  08030000  00000000  00000000
05001A04  101E0000  422C0000  A000006E  62080810  16080000  00000000  00000000
06002C04  00000000  00000000  00000000  60400000  00000000  00000000  00000000
07003A04  08080000  3A1E0000  A0000058  62082E08  00000000  00000000  00000000
09048804  2C260003  3A3D0000  9000007A  1C0A0408  03082F0E  04080603  03030308
3A440001  2B330000  08080000  08080A0A  0A0A0A00  1F1D2527  0E0E1414  0A047004
101A1000  1E282C00  5A00A072  20080836  08081012  08000000  00000000  26223801
1D192A00  08040800  0C040A0A  0A0A0A00  13101101E  12000014  08045204  0C381600
2E460000  A0700074  44040830  18080000  00000000  00000000  40401A01  30301300
08040400  08000A0A  0A0A0A00  23232308  14140A0A  0C048404  08080000  3C180000
A0000054  68082808  00000000  00000000  00000000  5A260001  431D0000  08040000
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
08040A0A  0A0A0A00  33331313  14141414  16001604  08080000  183C0000  A0000054
28086808  00000000  00000000  00000000  67003C04  08140003  43220000  9D000068
73080E0C  08030000  00000000  00000000  68002004  28200000  4C2E0000  A000007A
481C0408  08101008  00000000  00000000  69009004  2A180000  52260000  A0000078
5022080E  10080000  00000000  00000000  6A009E04  3A1F080B  482D0C00  8900958C
20041804  04080308  10080F08  04080608  78042604  1C1C0000  462A0000  A0000070
54140814  14080000  00000000  00000000  5A260001  431D0000  08040000  08040A0A
0A0A0A00  33331313  14140000  79045804  4F1A480C  5E280000  947E0092  1708140A
080E0814  040A0408  04080308  52254001  3D1C3000  08040800  00040A0A  0A0A0A00
2E181223  00000000  7A007A04  00000000  00000000  00000000  70300000  00000000
00000000  00000000  78039404  08080000  40160000  A0000056  70082008  00000000
00000000  00000000  60200001  48180000  08040000  08000A0A  0A0A0A00  37370F00
14141200  028E07A0  02120E10  025C0660  01E607A0  03C80A30  04741330  04881EB0
01520F50  02941850  019E1470  020C03D0  03701470  00E607AE  01B40510  02FC0880
04CE0E10  018E1330  032023D0  01021C20  025C0E10  00FC08F5  03A20B80  017810A0
054E0E10  008407AE  03400CC0  029430A0  04581470  02D80E10  01B015C0  02FC07A0
00000000
```

PATTERN NUMBER 7 SECTION 3

```
18008604  540E3C16  5C1C0000  8A6A008E  16040818  04040810  04040606  08081E04
19003A04  00000000  00000000  00000000  5C440000  00000000  00000000  00000000
1A009C04  5C200000  6A280000  A0000092  1C040818  08080D08  08080806  04080A04
1B004C04  62130000  70220000  A0000092  1C040818  08080D08  0F040704  040A0408
36035604  2C162200  38340000  A08A006C  0E2A080E  080F3408  00000000  00000000
453B3301  342C2400  08080800  00000A0A  0A0A0A00  26201B00  14141400  37040004
1616000A  2A320000  96000066  0E300804  0E3A0803  03000000  00000000  38400001
2A300000  08080000  08080A0A  0A0A0A00  1E1E2323  14141414  38000404  16160000
24300000  A0000054  0E5A080E  1A080000  00000000  00000000  3B031004  4E1C0003
5C2E0000  9D0008D  0E380E08  14250803  00000000  00000000  4A340001  37270000
08080000  08000A0A  0A0A0A00  29291C00  00001300  3C021604  2E160003  31300000
9D000064  1432040E  080E2708  03000000  00000000  4D310001  3A250000  08000000
08000A0A  0A0A0A00  28280000  14140000  3D025004  0C080005  30290000  9B00005E
4804083F  08050000  00000000  00000000  43390001  32280000  08080000  00000A0A
0A0A0A00  251F0000  14140000  3E002204  0C1C0000  422A0000  A000006C  6A04080E
14080000  00000000  00000000  3F008604  26260000  29290000  A0000052  0E3E1008
0E161008  00000000  00000000  40012804  26260000  2A2A0000  A0000054  0E3A1008
0E1A1008  00000000  00000000  4D330001  3A260000  08000000  00000A0A  0A0A0A00
2B000000  14000000  41009C04  16160036  2C282000  6A00008A  0E28080E  16080E20
08000000  00000000  42035A04  302E2010  3A360800  90760080  0E2A0812  08080B0E
08040404  04040408  48283301  36202600  08080800  00000A0A  0A0ACA00  2C161B00
14001400  43000804  19260000  28290000  A0000056  0E033D08  0F241008  00000000
00000000  44027804  2C160003  382E0000  9D000069  0E1E080E  080F3D08  03000000
00000000  38420001  2C320000  08080000  00000A0A  0A0A0A00  20250000  12140000
45025C04  16160016  19360000  8A000065  0E300B0E  080E2E08  00000000  00000000
38360001  2A290000  08080000  00000A0A  0A0A0A00  1E1D0000  140E0000  46022C04
16160019  19320000  87000064  0E380B0E  080E2308  03000000  00000000  3F2E0001
2F220000  08080000  00000A0A  0A0A0A00  22180000  14000000  47000004  48262A00
5A360000  A0700090  22080808  0F100404  04040803  08130B0A  48038A04  0C080005
36230000  9800005E  54040833  08050000  00000000  00000000  4D2F0001  3A230000
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
08080000 08000A0A 0A0A0A00 2B2B1900 14141400 49030004 0C080003 30290000
9000005C 48040841 0803 300 00000000 00000000 433A0001 322C0000 08080000
08000A0A 0A0A0A00 25252000 14141400 4A008C04 1A480000 1E4E0000 A000006C
0E380408 0E033508 00000000 00000000 48000004 16180803 2A261A00 78009D6D
0E1A081A 080E330A 03000000 00000000 4C021E04 1A260000 28290000 A0000051
0E320408 0E2E1008 00000000 00000000 3D430001 2E320000 08080000 00000A0A
0A0A0A00 21250000 14140000 4D024A04 16160000 26260000 A000004C 0E32080E
42080000 00000000 00000000 3A460001 2B350000 08080000 00000A0A 0A0A0A00
1F270000 14140000 51000404 16160000 262A0000 A0000050 0E2A080E 4A080000
00000000 00000000 52039C04 16160000 262A0000 A0000050 0E4A080E 2A080000
00000000 00000000 4D330001 3A260000 08080000 08000A0A 0A0A0A00 2B2B1B00
14141400 53002604 16160000 262A0000 A0000050 0E44080E 30080000 00000000
00000000 54025004 16160000 26200000 A0000046 0E44080E 30080000 00000000
00000000 48380001 362A0000 08080000 00000A0A 0A0A0A00 281E0000 14140000
55027404 1A260000 26290000 A000004F 0E360408 0E2A1008 00000000 00000000
40400001 30300000 08080000 00000A0A 0A0A0A00 23230000 14140000 56019404
161A0003 2E260000 9D000057 0E300408 0E3D0803 00000000 00000000 42380001
322C0000 08000000 00000A0A 0A0A0A00 25000000 14000000 57025604 0C080003
36230000 9D00005C 54040835 08030000 00000000 00000000 4D310001 3A250000
08080000 00000A0A 0A0A0A00 2B1A0000 14140000 58049A04 16312E03 2C490000
9D820078 0E3C080E 1A081308 03000000 00000000 423C2600 31201D00 08080800
08000A0A 0A0A0A00 24242113 14140000 59029C04 081C0003 36300000 9D000069
5A08141F 08030000 00000000 00000000 4E2F0000 3B230000 08080000 00000A0A
0A0A0A00 2C190000 140B0000 5A001404 262E0008 29310000 98000062 0E321008
0E121808 08000000 00000000 5B022404 16160026 20221000 60000068 0E1C080E
18080E2A 08000000 00000000 28250000 1F1C0000 08080000 00000A0A 0A0A0A00
14120000 120C0000 5D031604 16161600 1E1E1E00 7400A05A 0E2A080E 1E080E16
08000000 00000000 332A2347 261F1A00 08080800 00000A0A 0A0A0A00 18151100
14140E00 5E027C04 16160000 1F200000 A000003E 0E44080E 30080000 00000000
00000000 48380001 362A0000 08080000 00000A0A 0A0A0A00 281E0000 14140000
60003604 16160000 20200000 A0000040 0E4A080E 2A080000 00000000 00000000
61035204 1A160003 24280000 9D00004F 0E440408 0E290803 00000000 00000000
4B320001 38260000 08080000 08000A0A 0A0A0A00 2A2A1B00 14141400 63049604
16442600 34460000 A0800078 0E380818 08080E14 08000000 00000000 3E422801
2F311E00 08080800 08000A0A 0A0A0A00 22222414 14140C0C 64030A04 08080000
34240000 A0000058 58083808 00000000 00000000 00000000 4D330001 3A260000
08080000 00080A0A 0A0A0A00 2B1B1B00 14141400 01AC1990 000403D7 01EC0E10
00D803D7 02F215C0 03E61C20 00FE03D7 03CE1470 026C2000 04202000 03F41700
03481470 020E0660 00A603D7 022808F0 044C0CC0 03D01700 02680CC0 00000000
04061330 02E20F10 00000000 04101470 03D80E10 03921330 02680B80 00000000
02301330 01DC15C0 01120510 028807A0 03AE1C20 02361850 032815C0 04361C20
03AE1D70 00000000 028A2280 02482B80 00000000 035E1AE0 03EC31E0 0088028F
00000000 0098147A 00000000 038A1700 02741470 02CA23D0 04922280 01B60A30
04C410A0 033211E0 020E1330 03821D70 04080E10 04541330 00000000 052810A0
03CC0CC0 015E0510 046E08F0 03082510 02141850 063B1FB0 044010A0 03F60F50
042C1990 04081470 03AC1D70 038C0F50 040C1330 042C0B80 00FE028F 03840A30
022C0A30 03940CC0 01A80B80 01C403D0 03201850 03441330 03340B80 027C07A0
02CA0E10 03F01AE0 040C0E10 00DC0666 03720CC0 04721C20 04701330 03FC0B80
032A1990 04180B80 03720CC0 03C60B80 03A01470 03101AE0 01C20510 040E0B80
01E20A30 03401470 02020E10 03E415C0 020C1330 03400B80 025611E0 03441470
009007AE 019403D0 035208F0 018210A0 032B0E10 01342140 01F411E0 028A0A30
013410A0 030C15C0 036A15C0 00000000 02CC11E0 021015C0 02E00A30 034E08F0
03340A30 00000000 02BE1C20 02821470 03661AE0 03181990 036C1990 01AA31E0
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
02361330  021C1330  03360CC0  035C1330  03600CC0  02901330  011C1990  .01EC08F0



                    PATTERN NUMBER 7     SECTION 4

1C006804  2C200000  502E0000  A000007E  4616080E  18080608  00000000  00000000
1D002E04  21162403  2F2A0000  9D92005C  0E4F0803  08030E17  08000000  00000000
1E001C04  16160000  20200000  A0000040  0E46080E  2E080000  00000000  00000000
1F046004  1E144034  242E0000  6C880086  0A040406  04082604  04033404  04040803
1D3A3301  162B2400  08080800  00080A0A  0A0A0A00  0D1F1F1B  00141400  20008604
16360000  26440000  A000006A  0E46080E  080E1808  00000000  00000000  21022804
08080020  24161800  6A00005A  38083008  20080000  00000000  00000000  33202D01
26182200  08080000  00000A0A  0A0A0A00  1B0F0000  14120000  22006C04  16160006
2A2A0000  9A00005A  0E450803  0E290803  00000000  00000000  23008A04  08080000
2A2E0000  A0000058  44084C08  00000000  00000000  00000000  24004404  1A2C0000
30420000  A0000072  0E1E0408  0E163C08  00000000  00000000  25002004  3E083E03
4C104100  5C009DA0  0E121408  08080808  03030808  081A0408  26003204  16081600
2E162400  7400A068  0F48080E  080E1608  00000000  00000000  27002604  2E082E00
54160000  A07A006A  4C081E08  1E080000  00000000  00000000  28043C04  16160000
22320000  A0000054  0E4A080E  2A080000  00000000  00000000  4D330001  3A260000
08080000  08080A0A  0A0A0A00  2B2B1B1B  14140E0E  29020604  160C0000  203A0000
A000005A  0E22085C  04080000  00000000  00000000  2D530001  223E0000  08080000
00000A0A  0A0A0A00  172F0000  14140000  2A040004  2C081A03  3A2B0000  9D7D0068
24040845  08031808  00000000  00000000  403E2601  302E1D00  08080800  00080A0A
0A0A0A00  23222213  14141414  2B007C04  08080000  22380000  A000005A  32085E08
00000000  00000000  00000000  2C009604  08080000  24360000  A000005A  36085A08
00000000  00000000  00000000  2D027004  0C080003  22370000  9D00005C  2E04085B
08030000  00000000  00000000  2E4F0001  23380000  08080000  00000A0A  0A0A0A00
182D0000  14140000  2E002604  08080000  26320000  A0000058  3C085408  00000000
00000000  00000000  2F007404  1A160003  32240000  9D000059  0E530408  030E1A08
00000000  00000000  30009404  08080000  34240000  A0000058  58083808  00000000
00000000  00000000  31020C04  08080000  34240000  A0000058  58083808  00000000
00000000  00000000  4D330001  3A260000  08080000  00000A0A  0A0A0A00  2B1B0000
14140000  32033C04  08080000  36220000  A0000058  5C083408  00000000  00000000
00000000  50300001  3C240000  08080000  08000A0A  0A0A0A00  2D2D1900  14141400
33007604  08080000  44160000  A000005A  78081808  00000000  00000000  00000000
34006404  08080000  38220000  A000005A  5E083208  00000000  00000000  00000000
35038004  3E082600  4A280000  A07C0072  0E1C0408  1C083E08  00000000  00000000
48382B01  362A2000  08080800  00000A0A  0A0A0A00  281E1600  10141000  39028404
08080000  40160000  AC000056  70082008  00000000  00000000  00000000  60200001
48180000  08080000  00000A0A  0A0A0A00  370F0000  14120000  3A005004  00000000
00000000  00000000  742C0000  00000000  00000000  00000000  6D006E04  081A000D
32300000  9300006F  54080A0E  1D040803  00000000  00000000  6E007004  2E162000
38260000  A088005E  0E4A0810  080E1208  00000000  00000000  6F007400  1A160003
1E1E0000  4000003F  0F150408  030E0808  00000000  00000000  70005A04  1E280008
38360000  98000076  32120408  08202008  00000000  00000000  71001604  08080000
40160000  AC000056  6E082208  00000000  00000000  00000000  72009C04  16160000
1E280000  A0000046  0E5E080E  16080000  00000000  00000000  73028A04  16160000
22220000  A0000044  0F66080E  0F080000  00000000  00000000  631D0000  4A160000
08080000  00000A0A  0A0A0A00  390D0000  14000000  74002A04  16160000  20200000
A0000040  0E64080E  10080000  00000000  00000000  75000404  08080000  38220000
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
A000005A 5E083908 00000000 00000000 00000000 76003404 16160000 20200000
A0000040 0E620A0E 12080000 00000000 00000000 77005600 08080000 16160000
5000002C 22081F08 00000000 00000000 00000000 00460000 04261C20 046E2000
01AA07A0 01260880 01BA1330 06121990 03562660 015603D0 01F40510 06000E10
015C0510 050A0CC0 01020300 02680E10 028407A0 01D40510 061A0B80 058C0F50
020003D0 04A22510 04C415C0 022E08F0 023C0510 02580510 04041850 05BA1D70
02E20E10 024E0F10 02EC0E10 01C40CC0 03C40A30 03FC1470 021C1AE0 026C1850
063E1EB0 05882880 024C0660 05CA0E10 01EE1C20 03101850 057A10A0 01BE03D0
01280280 03D211E0 02AC1990 05901330 011A0A30 04D011E0 02DE0660 03261AE0
04DA1AE0 03480CC0 01C61990 044C11E0 04501D70 043C0B80 00A00CCC 00AE0666
026A0660 01A40A60 00000000
```

4.5.56
(Revision B)

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

CONT NO	CYCLE SEC	DIAL NO	DIAL NO 8 INTERVAL LENGTH - SECS 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	80.	8	55.0	4.0	17.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2	80.	8	45.0	2.0	4.0	11.0	4.0	4.0	6.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
3	80.	8	60.5	4.0	1.5	5.0	5.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
4	80.	8	54.5	4.0	1.5	14.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
5	80.	8	50.0	4.0	4.0	7.0	11.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6	80.	8	58.0	22.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
7	80.	8	54.0	4.0	18.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9	80.	8	11.5	5.0	2.0	4.0	1.5	4.0	26.0	7.0	2.0	4.0	3.0	1.5	1.5	1.5	1.5	4.0
10	80.	8	16.0	4.0	4.0	27.0	4.0	4.0	8.0	9.0	4.0	.0	.0	.0	.0	.0	.0	.0
11	80.	8	50.0	2.0	4.0	2.0	18.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12	80.	8	55.0	4.0	17.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13	80.	8	27.5	2.0	4.0	1.5	41.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
14	80.	8	54.5	4.0	1.5	4.0	12.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
15	80.	8	31.0	2.0	4.0	22.0	4.0	11.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0
16	80.	8	33.0	4.0	8.0	7.0	4.0	6.0	6.0	4.0	8.0	.0	.0	.0	.0	.0	.0	.0
17	80.	8	13.0	10.0	4.0	4.0	26.0	4.0	7.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0
18	80.	8	55.0	4.0	17.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19	80.	8	52.0	4.0	20.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20	80.	8	9.0	2.0	4.0	4.0	4.0	4.0	6.0	2.0	6.0	2.0	4.0	4.0	9.0	12.0	4.0	4.0
21	80.	8	38.5	2.0	4.0	1.5	14.0	14.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0
22	80.	8	32.0	4.0	40.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
23	80.	8	15.0	6.0	4.0	24.0	4.0	9.5	12.0	4.0	1.5	.0	.0	.0	.0	.0	.0	.0
24	80.	8	7.0	2.0	4.0	13.0	2.0	2.0	4.0	7.0	2.0	2.0	3.0	3.0	4.0	4.0	19.0	2.0
25	80.	8	46.0	34.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
26	80.	8	10.0	2.0	4.0	12.0	4.0	4.0	8.0	4.0	8.0	4.0	4.0	2.0	2.0	4.0	6.0	2.0
27	80.	8	10.0	2.0	4.0	8.0	4.0	4.0	10.5	4.0	7.5	2.0	4.0	2.0	2.0	10.0	2.0	4.0
28	80.	8	35.0	12.0	4.0	7.0	11.0	4.0	3.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
29	80.	8	7.0	37.0	4.0	3.0	4.0	1.5	7.0	12.5	4.0	.0	.0	.0	.0	.0	.0	.0
30	40.	8	7.0	10.0	4.0	7.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
31	80.	8	9.0	2.0	2.0	8.0	2.0	4.0	16.5	2.0	2.0	1.5	19.5	2.0	2.0	2.0	4.0	1.5
32	80.	8	7.0	35.0	4.0	7.0	4.0	7.0	12.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
33	80.	8	33.0	4.0	17.0	4.0	18.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
34	80.	8	7.0	28.5	4.0	1.5	7.0	26.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0
35	80.	8	52.0	4.0	20.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
36	80.	8	7.0	15.0	2.0	4.0	7.0	10.0	31.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
37	80.	8	7.0	9.0	11.0	4.0	4.0	4.0	4.0	4.0	1.5	1.5	4.0	4.0	4.0	12.0	2.0	4.0
38	80.	8	7.0	23.0	4.0	9.0	4.0	7.0	22.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
39	80.	8	36.0	4.0	12.0	4.0	20.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
40	80.	8	7.0	36.0	4.0	7.0	22.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
41	80.	8	7.0	31.0	4.0	32.0	2.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
42	80.	8	31.0	2.0	4.0	25.0	4.0	1.5	8.5	4.0	.0	.0	.0	.0	.0	.0	.0	.0
43	80.	8	31.0	4.0	41.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
44	80.	8	31.0	4.0	41.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
45	80.	8	26.0	2.0	4.0	42.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
46	80.	8	33.0	4.0	39.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
47	80.	8	7.0	25.0	2.0	4.0	1.5	7.0	29.5	4.0	.0	.0	.0	.0	.0	.0	.0	.0
48	80.	8	26.0	4.0	46.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

49	80.	8	31.0	4.0	41.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
50	80.	8	49.0	4.0	23.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
51	80.	8	60.0	4.0	12.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
52	80.	8	47.0	4.0	25.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
53	80.	8	7.0	26.0	2.0	4.0	12.0	4.0	21.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
54	80.	8	7.0	24.0	4.0	7.0	4.0	7.0	23.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
55	80.	8	7.0	30.0	4.0	2.0	7.0	23.0	4.0	1.5	1.5	.0	.0	.0	.0	.0	.0	.0
56	80.	8	7.0	45.0	4.0	7.0	13.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
57	40.	8	20.0	4.0	12.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
58	80.	8	57.0	23.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
59	80.	8	7.0	7.0	24.0	4.0	7.0	25.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0
60	80.	8	10.0	28.0	2.0	7.0	4.0	7.0	16.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0
61	80.	8	29.0	2.0	4.0	38.5	4.0	2.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
62	80.	8	50.0	2.0	4.0	10.0	10.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
63	80.	8	7.0	25.0	8.0	4.0	7.0	17.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
64	80.	8	7.0	29.0	8.0	4.0	7.0	13.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
65	80.	8	7.0	25.0	4.0	7.0	9.0	4.0	4.0	16.0	4.0	.0	.0	.0	.0	.0	.0	.0
66	80.	8	7.0	21.0	4.0	9.0	4.0	4.0	4.0	7.0	4.0	2.0	2.0	2.0	2.0	2.0	2.0	4.0
67	80.	8	7.0	1.5	24.5	4.0	7.0	24.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
68	80.	8	7.0	14.0	4.0	8.0	4.0	7.0	30.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0
69	80.	8	7.0	26.0	4.0	7.0	4.0	7.0	21.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
70	80.	8	7.0	23.0	4.0	7.0	4.0	7.0	22.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0
71	80.	8	16.0	4.0	4.0	4.0	7.0	9.0	2.0	2.0	2.0	2.0	4.0	1.5	4.0	10.5	4.0	4.0
72	80.	8	34.0	2.0	4.0	33.5	4.0	2.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
73	80.	8	40.0	2.0	4.0	28.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
74	80.	8	7.0	43.0	2.0	4.0	7.0	9.0	4.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
75	80.	8	7.0	17.0	4.0	15.0	4.0	7.0	19.5	5.0	1.5	.0	.0	.0	.0	.0	.0	.0
76	80.	8	7.0	38.0	2.0	4.0	7.0	10.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
77	80.	8	7.0	42.0	4.0	7.0	16.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
81	80.	8	7.0	38.0	4.0	7.0	20.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
82	80.	8	7.0	37.0	4.0	7.0	21.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
83	80.	8	7.0	32.0	4.0	7.0	26.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
84	80.	8	7.0	36.0	4.0	7.0	22.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
85	80.	8	7.0	30.0	2.0	4.0	7.0	18.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
86	80.	8	7.0	28.0	2.0	4.0	7.0	26.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0
87	80.	8	37.0	2.0	4.0	31.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
88	80.	8	7.0	29.0	4.0	7.0	15.0	4.0	8.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0
89	80.	8	38.0	4.0	10.0	22.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
90	80.	8	7.0	24.0	8.0	4.0	7.0	10.0	12.0	4.0	4.0	.0	.0	.0	.0	.0	.0	.0
91	80.	8	7.0	13.0	4.0	7.0	12.0	4.0	7.0	22.0	4.0	.0	.0	.0	.0	.0	.0	.0
93	80.	8	7.0	22.0	4.0	7.0	13.0	4.0	7.0	12.0	4.0	.0	.0	.0	.0	.0	.0	.0
94	80.	8	7.0	30.0	4.0	7.0	28.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
96	80.	8	7.0	37.0	4.0	7.0	21.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
97	80.	8	7.0	33.0	2.0	4.0	7.0	21.5	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0
99	80.	8	7.0	26.0	4.0	13.0	4.0	4.0	8.0	10.0	4.0	.0	.0	.0	.0	.0	.0	.0
100	80.	8	49.0	4.0	23.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
103	80.	8	58.0	4.0	5.5	7.0	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
104	80.	8	38.0	12.0	2.0	4.0	4.0	8.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
105	80.	8	43.0	14.0	4.0	7.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
106	80.	8	18.0	2.0	12.0	2.0	2.0	4.0	1.5	4.0	4.0	3.0	4.0	4.0	10.0	4.0	1.5	4.0
109	80.	8	45.0	4.0	5.0	7.0	11.5	2.0	4.0	1.5	.0	.0	.0	.0	.0	.0	.0	.0
110	80.	8	7.0	37.0	4.0	8.0	4.0	7.0	9.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0
111	40.	8	7.0	8.5	2.0	4.0	1.5	7.0	6.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

112	80.	8	25.0	9.0	2.0	4.0	4.0	16.0	16.0	4.0.	.0	.0	.0	.0	.0	.0	.0	.0
113	80.	8	62.0	4.0	10.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
114	80.	8	7.0	47.0	4.0	7.0	11.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
115	40.	8	7.0	12.0	4.0	7.0	6.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
116	40.	8	7.0	10.0	4.0	7.0	8.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
117	40.	8	16.0	4.0	16.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
118	40.	8	7.0	12.0	4.0	7.0	6.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
119	40.	8	18.0	4.0	14.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
120	80.	8	42.0	10.0	4.0	10.0	10.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
121	80.	8	15.0	4.0	10.5	5.0	4.0	7.0	4.0	6.0	2.0	5.0	2.0	4.0	2.0	4.0	1.5	4.0
122	80.	8	56.0	24.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
123	80.	8	57.0	4.0	15.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

DIAL NUMBER 8

CONT NO	TKMIN	SUMA	SUMB	SUMC	SUMTOT	GAMIN	GBMIN	GCMIN	GAB	GBC	GABC
1	43.0	4.0	4.0	.0	.0	32.0	11.0	.0	80.0	.0	.0
2	54.0	6.0	4.0	4.0	4.0	29.0	11.0	10.0	66.0	.0	76.0
3	50.0	4.0	5.0	.0	5.5	34.5	10.0	.0	74.5	.0	.0
4	46.0	4.0	4.0	.0	3.0	31.5	11.5	.0	77.0	.0	.0
5	55.0	8.0	15.0	.0	.0	33.0	22.0	.0	80.0	.0	.0
7	42.0	4.0	4.0	.0	.0	31.0	11.0	.0	80.0	.0	.0
9	63.0	22.0	19.0	.0	1.5	29.5	32.0	.0	78.5	.0	.0
10	57.0	8.0	13.0	8.0	.0	15.0	20.0	22.0	45.0	.0	80.0
11	44.0	6.0	6.0	11.0	.0	31.0	13.0	.0	80.0	78.0	.0
12	43.0	4.0	4.0	.0	.0	32.0	11.0	.0	80.0	.0	.0
13	47.0	6.0	5.5	.0	.0	20.5	26.5	.0	80.0	.0	.0
14	48.0	9.5	4.0	31.5	.0	37.0	11.0	.0	80.0	74.5	.0
15	64.0	41.0	4.0	14.0	1.5	51.0	11.5	.0	78.5	41.5	.0
16	64.0	31.0	10.0	21.0	.0	48.0	16.0	.0	80.0	53.0	.0
17	61.0	18.0	4.0	12.0	.0	25.0	17.0	19.0	61.0	.0	80.0
18	43.0	4.0	4.0	.0	.0	32.0	11.0	.0	80.0	.0	.0
19	42.0	4.0	4.0	.0	.0	30.0	12.0	.0	80.0	.0	.0
20	76.0	10.0	16.0	.0	36.0	17.0	23.0	.0	44.0	.0	.0
21	54.0	6.0	18.5	.0	3.0	25.5	25.5	.0	77.0	.0	.0
22	44.0	4.0	4.0	.0	.0	20.0	24.0	.0	80.0	.0	.0
23	70.0	38.0	16.0	.0	1.5	45.0	23.5	.0	78.5	.0	.0
24	71.0	42.0	7.0	29.0	11.0	46.0	14.0	.0	69.0	52.0	.0
26	77.0	50.0	16.0	.0	.0	57.0	20.0	.0	80.0	.0	.0
27	77.0	52.5	10.0	.0	.0	59.5	17.5	.0	80.0	.0	.0
28	63.0	23.0	15.0	.0	.0	41.0	22.0	.0	80.0	.0	.0
29	47.5	18.0	11.0	18.0	1.5	25.0	21.0	.0	78.5	71.5	.0
30	32.0	11.0	11.0	.0	.0	16.0	16.0	.0	40.0	.0	.0
31	63.0	19.0	10.0	29.5	23.5	22.0	17.5	.0	56.5	64.0	.0
32	53.0	11.0	27.0	.0	.0	19.0	34.0	.0	80.0	.0	.0
33	43.0	4.0	4.0	.0	11.0	21.0	11.0	7.0	59.0	.0	.0
34	45.0	11.0	11.0	.0	3.0	21.0	21.0	.0	77.0	.0	.0
35	42.0	4.0	4.0	.0	.0	30.0	12.0	.0	80.0	.0	.0
36	56.0	13.0	21.0	.0	.0	24.0	32.0	.0	80.0	.0	.0
37	80.0	32.0	4.0	30.0	1.5	39.0	8.0	31.5	47.0	.0	78.5
38	52.0	11.0	4.0	11.0	.0	23.0	11.0	18.0	47.0	.0	80.0
39	50.0	20.0	4.0	22.0	.0	38.0	12.0	.0	80.0	64.0	.0
40	42.0	11.0	11.0	.0	.0	17.0	25.0	.0	80.0	.0	.0
41	38.0	11.0	6.0	.0	.0	16.0	22.0	.0	80.0	.0	.0
42	53.0	18.5	4.0	22.0	1.5	34.5	17.0	.0	78.5	66.0	.0
43	45.0	4.0	4.0	.0	.0	20.0	25.0	.0	80.0	.0	.0
44	45.0	4.0	4.0	.0	.0	20.0	25.0	.0	80.0	.0	.0
45	46.0	6.0	4.0	.0	1.5	19.0	25.5	.0	78.5	.0	.0
46	45.0	4.0	4.0	.0	.0	21.0	24.0	.0	80.0	.0	.0
47	44.5	13.0	11.0	.0	1.5	25.0	18.0	.0	78.5	.0	.0
48	44.0	4.0	4.0	.0	.0	17.0	27.0	.0	80.0	.0	.0
49	45.0	4.0	4.0	.0	.0	20.0	25.0	.0	80.0	.0	.0

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

50	44.0	4.0	4.0	.0	.0	29.0	15.0	.0	80.0	.0	.0
51	45.0	4.0	4.0	.0	.0	34.0	11.0	.0	80.0	.0	.0
52	45.0	4.0	4.0	.0	.0	28.0	17.0	.0	80.0	.0	.0
53	48.0	29.0	4.0	19.0	.0	35.0	13.0	.0	80.0	64.0	.0
54	54.0	22.0	11.0	17.0	.0	29.0	24.0	.0	80.0	69.0	.0
55	51.0	11.0	11.0	.0	5.0	21.0	25.0	.0	75.0	.0	.0
56	42.0	11.0	11.0	.0	.0	18.0	24.0	.0	80.0	.0	.0
57	23.0	4.0	4.0	.0	.0	12.0	11.0	.0	40.0	.0	.0
59	46.5	18.0	11.0	.0	1.5	25.0	20.0	.0	78.5	.0	.0
60	50.0	23.0	11.0	.0	1.5	24.5	24.0	.0	78.5	.0	.0
61	47.0	6.0	4.0	.0	2.5	21.0	23.5	.0	77.5	.0	.0
62	52.0	6.0	14.0	.0	.0	31.0	21.0	.0	80.0	.0	.0
63	41.0	19.0	19.0	.0	.0	20.5	20.5	.0	80.0	.0	.0
64	42.0	19.0	19.0	.0	.0	21.0	21.0	.0	80.0	.0	.0
65	66.0	11.0	11.0	.0	24.0	22.0	20.0	16.0	56.0	.0	.0
66	64.0	24.0	23.0	16.0	8.0	29.0	27.0	4.0	72.0	59.0	.0
67	43.0	12.5	19.0	.0	.0	22.5	20.5	.0	80.0	.0	.0
68	53.5	23.0	11.0	.0	1.5	29.0	23.0	.0	78.5	.0	.0
69	50.5	11.0	11.0	.0	11.0	12.5	27.0	.0	69.0	.0	.0
70	50.0	11.0	11.0	.0	12.5	12.5	25.0	.0	67.5	.0	.0
71	72.0	36.0	19.0	21.0	.0	45.0	27.0	.0	80.0	56.0	.0
72	47.0	6.0	4.0	.0	2.5	23.0	21.5	.0	77.5	.0	.0
73	46.0	6.0	4.0	.0	1.5	26.0	18.5	.0	78.5	.0	.0
74	31.5	13.0	15.0	.0	.0	15.0	16.5	.0	80.0	.0	.0
75	54.5	11.0	12.0	4.0	1.5	21.0	19.0	13.0	59.5	.0	78.5
76	40.5	13.0	19.0	.0	.0	20.0	20.5	.0	80.0	.0	.0
77	38.0	11.0	11.0	.0	.0	19.0	19.0	.0	80.0	.0	.0
81	40.0	11.0	11.0	.0	.0	19.0	21.0	.0	80.0	.0	.0
82	40.0	11.0	11.0	.0	.0	19.0	21.0	.0	80.0	.0	.0
83	40.0	11.0	11.0	.0	.0	19.0	21.0	.0	80.0	.0	.0
84	35.0	11.0	11.0	.0	.0	19.0	16.0	.0	80.0	.0	.0
85	39.5	13.0	19.0	.0	.0	19.0	20.5	.0	80.0	.0	.0
86	43.5	11.0	13.0	.0	1.5	23.0	19.0	.0	78.5	.0	.0
87	47.0	6.0	4.0	.0	1.5	25.0	20.5	.0	78.5	.0	.0
88	59.0	11.0	23.5	23.0	1.5	22.0	35.5	.0	78.5	66.0	.0
89	48.5	4.0	14.0	.0	1.5	23.0	24.0	.0	78.5	.0	.0
90	49.0	19.0	23.0	.0	4.0	20.5	24.5	.0	76.0	.0	.0
91	52.0	11.0	11.0	.0	19.0	16.0	17.0	8.0	47.0	.0	.0
93	45.0	11.0	11.0	11.0	.0	15.0	15.0	15.0	57.0	.0	80.0
94	31.0	11.0	11.0	.0	.0	15.0	16.0	.0	80.0	.0	.0
96	32.0	11.0	11.0	.0	.0	16.0	16.0	.0	80.0	.0	.0
97	39.5	13.0	11.0	.0	1.5	18.0	20.0	.0	78.5	.0	.0
99	62.0	11.0	35.0	19.0	.0	26.0	36.0	.0	80.0	63.0	.
100	44.0	4.0	4.0	.0	.0	29.0	15.0	.0	80.0	.0	.0
103	51.0	4.0	11.0	.0	1.5	33.0	16.5	.0	78.5	.0	.0
104	60.0	18.0	16.0	.0	.0	37.0	23.0	.0	80.0	.0	.0
105	59.0	18.0	12.0	.0	.0	40.0	19.0	.0	80.0	.0	.0
106	66.0	27.5	11.0	4.0	5.5	34.5	15.0	11.0	60.5	.0	74.5
109	57.5	4.0	13.0	.0	6.5	27.0	24.0	.0	73.5	.0	.0
110	47.0	23.0	11.0	16.0	.0	28.0	19.0	.0	80.0	68.0	.0
111	31.5	13.0	11.0	.0	1.5	15.0	15.0	.0	38.5	.0	.0
112	59.0	15.0	20.0	.0	4.0	28.0	27.0	.0	76.0	.0	.0
113	46.0	4.0	4.0	.0	.0	35.0	11.0	.0	80.0	.0	.0

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

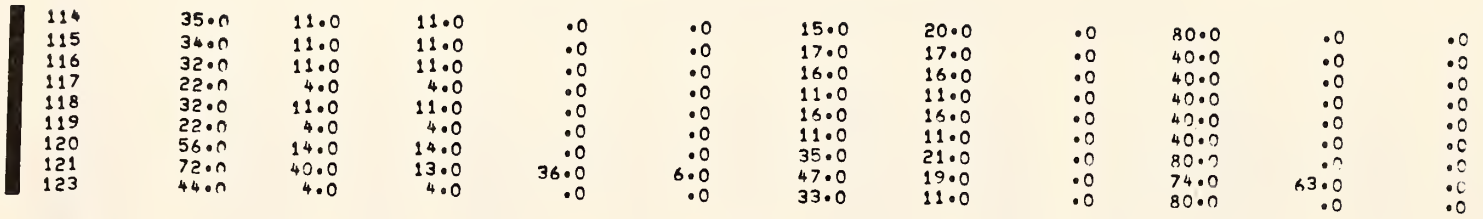


FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

DIAL NUMBER 8

CONT NO	QK A1	QK A2	QK B1	QK B2	QK C1	MAX EXTENSIONS 1	2	3	4	GU A	B	C	GL A	B	C	BUS LINK PERIODS 1	2	3	4
9	2	2	2	2	0	0.	0.	10.	10.	27.	36.	0.	20.	27.	0.	28.	26.	39.	41.
10	2	0	1	1	2	9.	0.	0.	10.	19.	17.	28.	14.	13.	21.	19.	16.	16.	30.
11	2	2	1	0	1	10.	10.	10.	10.	45.	19.	18.	34.	14.	13.	51.	51.	19.	17.
12	2	2	1	1	0	10.	10.	10.	10.	47.	17.	0.	35.	13.	0.	54.	54.	16.	16.
15	2	0	2	0	2	10.	0.	10.	0.	50.	12.	21.	38.	9.	16.	58.	10.	21.	0.
17	2	2	2	0	2	6.	6.	10.	0.	25.	24.	15.	19.	18.	11.	26.	22.	25.	14.
31	2	0	2	2	2	5.	10.	10.	5.	22.	24.	28.	16.	18.	21.	22.	25.	25.	29.
33	2	0	2	0	0	10.	10.	0.	0.	30.	18.	17.	22.	13.	13.	32.	17.	0.	0.
40	2	2	2	2	0	10.	10.	8.	8.	38.	26.	0.	28.	20.	0.	42.	42.	28.	28.
41	2	0	2	0	0	10.	10.	0.	0.	34.	30.	0.	25.	23.	0.	37.	33.	0.	0.
42	2	0	2	2	2	10.	10.	10.	10.	40.	23.	30.	30.	17.	22.	45.	24.	24.	32.
45	2	0	2	0	0	10.	10.	0.	0.	26.	37.	0.	19.	28.	0.	27.	41.	0.	0.
49	2	0	2	0	0	10.	10.	0.	0.	28.	36.	0.	21.	27.	0.	30.	40.	0.	0.
50	2	2	2	0	0	10.	10.	10.	0.	42.	22.	0.	32.	16.	0.	48.	48.	22.	0.
53	2	0	2	0	2	10.	10.	10.	0.	44.	20.	31.	33.	15.	23.	50.	20.	34.	0.
54	2	0	2	0	2	10.	8.	10.	0.	37.	27.	28.	28.	20.	21.	41.	29.	30.	0.
55	2	2	2	2	0	10.	10.	9.	9.	33.	27.	0.	25.	20.	0.	36.	36.	29.	29.
57	2	0	2	0	0	10.	5.	0.	0.	19.	13.	0.	14.	10.	0.	19.	11.	0.	0.
59	2	2	2	0	0	10.	10.	10.	0.	34.	29.	0.	25.	22.	0.	37.	37.	31.	0.
60	2	2	0	0	0	10.	10.	0.	0.	41.	22.	0.	31.	16.	0.	46.	46.	0.	0.
61	2	0	2	0	0	10.	10.	0.	0.	28.	34.	0.	21.	25.	0.	30.	37.	0.	0.
64	2	0	0	0	0	10.	0.	0.	0.	38.	26.	0.	29.	19.	0.	43.	0.	0.	0.
66	2	0	2	0	2	10.	0.	10.	0.	36.	22.	26.	27.	16.	19.	44.	22.	27.	0.
68	2	0	2	0	0	8.	10.	0.	0.	30.	33.	0.	22.	25.	0.	32.	36.	0.	0.
69	2	0	2	0	0	10.	5.	0.	0.	30.	26.	0.	22.	19.	0.	32.	27.	0.	0.
70	2	0	2	0	0	10.	8.	0.	0.	27.	27.	0.	20.	20.	0.	29.	28.	0.	0.
72	2	2	2	0	0	10.	10.	10.	0.	32.	30.	0.	24.	23.	0.	35.	35.	32.	0.
73	2	2	2	0	0	10.	10.	10.	0.	37.	26.	0.	28.	19.	0.	41.	41.	27.	0.
76	2	0	2	0	0	10.	8.	0.	0.	41.	23.	0.	31.	17.	0.	46.	24.	0.	0.
77	2	0	2	0	0	10.	8.	0.	0.	42.	22.	0.	32.	16.	0.	48.	22.	0.	0.
82	2	2	2	0	0	10.	10.	10.	0.	38.	26.	0.	29.	19.	0.	43.	43.	27.	0.
84	2	0	2	0	0	10.	10.	0.	0.	38.	26.	0.	28.	20.	0.	42.	28.	0.	0.
85	2	0	2	0	0	10.	10.	0.	0.	34.	30.	0.	26.	22.	0.	38.	32.	0.	0.
86	2	0	0	0	0	10.	0.	0.	0.	30.	33.	0.	23.	25.	0.	32.	0.	0.	0.
87	2	0	2	0	0	10.	10.	0.	0.	34.	28.	0.	26.	21.	0.	38.	30.	0.	0.
88	2	2	2	0	2	10.	10.	0.	0.	32.	31.	21.	24.	23.	16.	35.	35.	33.	21.
89	2	0	2	0	0	10.	10.	0.	0.	34.	29.	0.	25.	22.	0.	37.	31.	0.	0.
91	2	0	2	0	0	8.	6.	0.	0.	19.	18.	0.	14.	14.	0.	19.	18.	0.	0.
93	2	0	2	0	2	10.	9.	8.	0.	26.	19.	18.	20.	14.	14.	28.	19.	18.	0.
94	2	0	2	0	0	10.	10.	0.	0.	33.	31.	0.	25.	23.	0.	36.	34.	0.	0.
97	2	2	2	0	0	10.	10.	10.	0.	37.	26.	0.	28.	19.	0.	41.	41.	27.	0.
99	2	2	2	0	2	10.	10.	7.	7.	30.	34.	21.	22.	26.	16.	32.	32.	38.	21.
100	2	0	2	2	0	10.	10.	10.	0.	42.	22.	0.	32.	16.	0.	48.	22.	22.	0.
115	2	0	2	0	0	6.	0.	0.	0.	18.	14.	0.	14.	10.	0.	18.	12.	0.	0.
120	2	2	1	1	0	10.	10.	0.	0.	45.	19.	0.	34.	14.	0.	51.	51.	19.	19.

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
121        2  0  1  1  2       8.   0.   0.   8.      44. 15. 35.      33. 11. 26.      50.  20.  14.  39.
123        2  2  1  0  0      10.  10.   8.   0.      49. 15.  0.      37. 11.  0.      56.  56.  14.   0.
```

CONTROLLER	OFFSET	CIC TOD FLAG
1	58.0	0
2	11.0	0
3	8.0	0
4	3.5	0
5	48.0	0
6	56.0	0
7	51.0	0
9	21.0	1
10	13.0	1
11	69.0	1
12	45.0	1
13	42.0	0
14	72.0	0
15	3.0	1
16	3.0	0
17	46.0	1
18	69.0	0
19	66.0	0
20	5.0	0
21	76.0	0
22	64.0	0
23	4.0	0
24	48.0	0
25	37.0	0
26	67.0	0
27	38.0	0
28	54.0	0
29	79.0	0
30	53.0	0
31	13.0	1
32	14.0	0
33	27.0	1
34	50.0	0
35	43.0	0
36	22.0	0
37	3.0	0
38	29.0	0
39	14.0	0
40	3.0	1
41	67.0	1
42	56.0	1
43	67.0	0
44	8.0	0
45	62.0	1
46	43.0	0
47	77.0	0
48	74.0	0
49	14.0	1

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

50	77.0	1
51	6.0	0
52	72.0	0
53	64.0	1
54	27.0	1
55	21.0	1
56	26.0	0
57	30.0	1
58	5.0	0
59	46.0	1
60	48.0	1
61	11.0	1
62	18.0	0
63	10.0	0
64	6.0	1
65	51.0	1
66	50.0	1
67	75.0	0
68	69.0	1
69	64.0	1
70	.0	1
71	78.0	0
72	77.0	1
73	.0	1
74	22.0	0
75	33.0	0
76	50.0	1
77	54.0	1
81	31.0	0
82	45.0	1
83	62.0	0
84	78.0	1
85	9.0	1
86	21.0	1
87	11.0	1
88	43.0	0
89	3.0	0
90	77.0	0
91	11.0	0
93	61.0	1
94	61.0	1
96	64.0	0
97	77.0	1
99	32.0	1
100	13.0	1
103	5.0	0
104	10.0	0
105	77.0	0
106	64.5	0
109	50.0	0
110	48.0	0
111	51.0	0
112	42.0	0

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

113	8.0	0
114	.0	0
115	22.0	0
116	40.0	0
117	10.0	0
118	51.0	0
119	40.0	0
120	43.0	1
121	11.5	1
122	53.0	0
123	53.0	1

PATTERN NUMBER 8 SECTION 1

```
01007404 08080000 40160000 A0000056 6E082208 00000000 00000000 00000000
0D005404 0C080000 29350000 A000005E 37040803 52080000 00000000 00000000
0E009004 13083F00 4A160000 A0950060 6D080308 18080000 00000000 00000000
0F030604 52081C03 66170000 9D530080 3E040820 08170803 00000000 00000000
65192A01 4C131F00 08080800 00000A0A 0A0A0A00 3A081500 14001400 10000604
3E142A00 60200000 A06A0080 4208100E 080C0C08 10000000 00000000 11045C04
24081800 32222A00 7A00A07A 1A140808 34080E10 08000000 00000000 32301E01
25241700 08080800 08000A0A 0A0A0A00 1A16190E 0C0C1400 12008A04 08080000
40160000 A0000056 6E082208 00000000 00000000 00000000 13008404 08080000
3C180000 A0000054 68082808 00000000 00000000 00000000 14000A04 14200048
222E0000 58000098 12040808 08080C04 0C040808 12180808 15009804 0C250006
33330000 9A00006C 4D040803 1C1D0803 00000000 00000000 17000804 4C200003
5A2F0000 9D00008C 1E0C0830 08131808 03000000 00000000 03BA08F0 04F81AE0
029A1AE0 02400510 01821470 015A08F0 02BE1330 01921700 01900510 030E1EB0
02AC15C0 03360A30 02FC08F0 00000000 03BE0880 02060B80 011603D0 023E0510
02C60660 02260A30 02C40660 01220280 00A8028F 03520E10 036811E0 00CA051E
02C615C0
```

PATTERN NUMBER 8 SECTION 2

```
02001604 0C080808 3A161400 8400986C 5A040816 08080C08 00000000 00000000
03001004 080A000B 45140000 95000064 79080308 0A080000 00000000 00000000
04000704 08080006 3F170000 9A00005C 6D08031D 08030000 00000000 00000000
05006004 101E0000 422C0000 A000006E 640B080E 16080000 00000000 00000000
06007004 00000000 00000000 00000000 742C0000 00000000 00000000 00000000
07006604 08080000 3E160000 A0000054 6C082408 00000000 00000000 00000000
09042A04 2C260003 3B400000 9D000078 170A0408 0308340E 04080603 03030308
36480001 28360000 08080000 08080A0A 0A0A0A00 1D1A2829 00001414 0A041A04
101A1000 1E282C00 5A00A072 20080836 08081012 08000000 00000000 26223801
1D192A00 08040800 00040A0A 0A0A0A00 1310101E 12000014 0B048A04 0C0C1600
3E1A0000 A09C0058 64040804 24080000 00000000 00000000 5A262301 431D1A00
08040400 08000A0A 0A0A0A00 33331311 14141414 0C045A04 08080000 40160000
A0000056 6E082208 00000000 00000000 00000000 5E220001 47190000 08040000
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
08040A0A 0A0A0A00 36361010 14141414 16008004 08080000 28300000 A0000058
40085008 00000000 00000000 00000000 67000A04 08160003 42210000 9D000066
74080B0E 08030000 00000000 00000000 68001404 24200000 4A2E0000 A0000078
4C180408 08101008 00000000 00000000 69009A04 24180000 50260000 A0000076
561C080E 10080000 00000000 00000000 6A008104 37160808 451E1600 79009584
24041804 04080308 08060808 14080308 78045604 1C1C0000 462A0000 A0000070
54140814 14080000 00000000 00000000 5A260001 431D0000 08040000 08040A0A
0A0A0A0D 33331313 14140000 79041704 501A480C 5E260000 947E0090 1E08150A
080E080C 040A0408 04080308 581E4601 42173500 08040800 00040A0A 0A0A0A00
32140E27 10000010 7A006A04 00000000 00000000 00000000 70300000 00000000
00000000 00000000 7B036A04 08080000 42160000 A0000058 72081E08 00000000
00000000 00000000 621E0001 49170000 08040000 08000A0A 0A0A0A00 38380E00
14141000 02C60660 02260A30 02C40660 01220280 00A8028F 03520E10 036811E0
00CA051E 02C615C0 00AA051E 00620666 02600A30 00B20666 01FF0510 01E407A0
02040300 01521330 03840CC0 00C40885 039C0CC0 00C40666 040E0F50 01080B80
035C0E10 019C1AE0 03860A30 01A21990 02EC0CC0 03A80E10 00E80A3D 03540CC0
00000000
```

PATTERN NUMBER 8 SECTION 3

```
18006004 540E3A16 5C1C0000 8A68008E 0E04081A 0404080E 04040606 08082604
19004A04 00000000 00000000 00000000 5C440000 00000000 00000000 00000000
1A008604 64200000 72280000 A000009A 14040818 08081008 10080804 04080C04
1B004C04 69140000 77230000 A000009A 14040810 08081508 0F040804 04140408
36033604 2C162200 38340000 A08A006C 0E300808 080E2E08 00000000 00000000
4A363801 37292A00 08080800 00000A0A 0A0A0A00 291D1E00 14101400 37042A04
1616000A 2A320000 96000066 0E3C0804 0E2E0803 03000000 00000000 42360001
31290000 08080000 08080A0A 0A0A0A00 24241D1D 14141212 38003404 16160000
24300000 A0000054 0E5A080E 1A080000 00000000 00000000 3B035C04 24160003
32280000 9D00005D 0F0E3008 0E330803 00000000 00000000 433A0001 322C0000
08080000 08000A0A 0A0A0A00 25252000 14141400 3C026004 2E160003 31300000
9D000064 1438040E 080E2108 03000000 00000000 522C0001 3D210000 08000000
08000A0A 0A0A0A00 2F2E0000 14140000 3D021604 0C080005 2A2F0000 9B00005E
3A040B4D 08050000 00000000 00000000 38440001 2A330000 08080000 00000A0A
0A0A0A0D 1E260000 14140000 3E002404 0C1C0000 3E2A0000 A0000068 64040814
14080000 00000000 00000000 3F001404 26260000 29290000 A0000052 0E321008
0E221008 00000000 00000000 40010C04 26260000 2A2A0000 A0000054 0E3A1008
0E1A1008 00000000 00000000 4D330001 3A260000 08000000 00000A0A 0A0A0A00
28000000 14000000 41006604 16160030 2C282000 70000084 0E320B0E 12080820
08000000 00000000 42036404 302E2010 3A360800 90760080 0E2A0812 0808080E
08040404 04040408 48283301 36202600 08080800 00000A0A 0A0A0A00 2C161B00
14001400 43009404 19260000 2D290000 A0000056 0E033108 0E301008 00000000
00000000 44028A04 2F160003 3A2E0000 9D00006B 0F1C0810 080F3D08 03000000
00000000 3B420001 2C320000 0F080000 00000A0A 0A0A0A00 20250000 10140000
45028004 16160016 19360000 8A000065 0E340B0E 080E2A08 00000000 00000000
3B330001 2C260000 08080000 00000A0A 0A0A0A00 201B0000 140A0000 46020004
16160019 19320000 87000064 0F2E080E 080E2D08 03000000 00000000 36360001
29280000 08080000 00000A0A 0A0A0A00 1D1D0000 14110000 47009C04 48262A00
5A360000 A0700090 20080808 0E120404 04040803 08150808 48039A04 0C080005
2E280000 9B00005E 44040843 08050000 00000000 00000000 403C0001 302D0000
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
08080000 08000A0A 0A0A0A00 23232100 14141400 49030004 0C080003 34250000
9D00005C 50040839 08030000 00000000 00000000 [illegible] 37270000 08080000
08000A0A 0A0A0A00 29291C00 14141400 4A002C04 1A1E0000 1E210000 A000003F
0E560408 0E120808 00000000 00000000 4B004204 16180803 2A261A00 77009D6D
0E22081E 080E270A 03000000 00000000 4C026404 1A260000 28290000 A0000051
0E4C0408 0E141008 00000000 00000000 522E0001 3D230000 08080000 00000A0A
0A0A0A00 2E180000 14110000 4D026C04 16160000 26260000 A000004C 0E54080E
20080000 00000000 00000000 55280001 40200000 08080000 00000A0A 0A0A0A00
30160000 14100000 51003E04 16160000 262A0000 A0000050 0E4C080E 28080000
00000000 00000000 52035A04 16160000 262A0000 A0000050 0E4A080E 2A080000
00000000 00000000 4D330001 3A260000 08080000 08000A0A 0A0A0A00 2B2B1B00
14141400 53007C04 16160000 262A0000 A0000050 0E40080E 34080000 00000000
00000000 54029F04 16160000 26200000 A0000046 0E480808 2C080000 00000000
00000000 4B350001 38280000 08080000 00000A0A 0A0A0A00 2A1C0000 14140000
55021204 1A260000 26290000 A000004F 0E3C0408 0E241008 00000000 00000000
453B0001 342C0000 08080000 00000A0A 0A0A0A00 26200000 14140000 56012A04
161A0003 2E260000 9D000057 0E380408 0E350803 00000000 00000000 3C420001
2D310000 08000000 00000A0A 0A0A0A00 21000000 14000000 57021604 0C080003
32290000 9D00005E 4A04083F 08030000 00000000 00000000 45390001 342B0000
08080000 00000A0A 0A0A0A00 261F0000 14140000 58045604 162F2E03 2C470000
9D840076 0E3A080E 1E081108 03000000 00000000 403E2A00 302F1F00 08080800
08000A0A 0A0A0A00 23232215 14140000 59020604 081C0003 2E300000 9D000061
4C08142D 08030000 00000000 00000000 433A0000 322C0000 08080000 00000A0A
0A0A0A00 25200000 14140000 5A009A04 262E0008 29310000 98000062 0E301008
0E141808 08000000 00000000 5B021604 16160026 20221000 5E000068 0F1A080E
18080E2C 08000000 00000000 26250000 1D1C0000 08080000 00000A0A 0A0A0A00
13120000 100C0000 5D037A04 16161600 1E1E1E00 7200A05A 0E2C080E 1A080E18
08000000 00000000 35262501 281D1C00 08080800 00000A0A 0A0A0A00 1C131200
14121000 5E027A04 16160000 1F200000 A000003E 0E3C080E 38080000 00000000
00000000 423E0001 312F0000 08080000 00000A0A 0A0A0A00 24220000 14140000
600C8004 16160000 20200000 A0000040 0E4A080E 2A080000 00000000 00000000
61039A04 1A160003 242B0000 9D00004F 0E420408 0E2B0803 00000000 00000000
4A340001 37270000 08080000 08000A0A 0A0A0A00 29291C00 14141400 63044004
16462600 34480000 A07E007C 0F34081A 08081014 08000000 00000000 3B452A01
2C341F00 08080800 08000A0A 0A0A0A00 20202615 14140E0E 64031A04 08080000
3A1E0000 A0000058 62082E08 00000000 00000000 00000000 552B0001 40200000
08080000 0C080A0A 0A0A0A00 30161600 14141400 024E0A30 017C03D0 018A0A30
011C07A0 033A1470 02D415C0 000203D7 037C1700 021E10A0 03901D70 04261AE0
033A15C0 02600660 03E81330 02C411E0 026215C0 039211E0 02C40B80 00000000
029E0A30 02EC1470 01F41EB0 029210A0 04061AE0 038A1470 01E010A0 00000000
01C20CC0 01E80CC0 01320510 029C0CC0 035C1C20 02F01C20 018408F0 036611E0
03041AE0 00000000 01A810A0 01C21470 00000000 04141850 02D81EB0 0076028F
00000000 00C20C6A 00000000 03441700 025410A0 02A81C20 03A81990 02640A30
02500A30 03401700 02660CC0 025A0CC0 024007A0 02920A30 00000000 03320A30
03CC08F0 00F4028F 02480510 02CC0E10 013A0300 03140BF0 0360CF50 02400E10
04DC15C0 03160F50 038F15C0 02FE0A30 02601990 037E0A30 01740510 02282140
02060B80 03FA0F10 01AC0B80 01C003D0 028210A0 01A60A30 035A08F0 022E0CC0
01C808F0 038210A0 03240CC0 00AE07AE 027815C0 031E1990 046F15C0 03582510
031E1330 026E0460 027815C0 03423990 03062280 02D81700 01BC08F0 02CC0B80
01C41330 03361470 022A1850 02C611E0 021210A0 03041700 01BE0B80 028E10A0
00AC0B85 02220460 02E60B80 01EE0F50 022208F0 01940CC0 02BC1330 028008F0
00F60CCC 02261990 031415C0 00000000 030011E0 01F81990 023A07A0 03C80E10
02400660 00000000 02561AE0 02941AE0 02360E10 02380A30 02CC1470 01F02660
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

```
02360A30  02040A30  02840CC0  027A15C0  03260B80  01DE11E0  013011E0  01FA0870


                    PATTERN NUMBER 8      SECTION 4

1C006C04  2E1E0000  522C0000  A000007E  4618080E  16080608  00000000  00000000
1D009E04  24162403  3F2A0000  9D8F005F  0E4A0806  08030E19  08000000  00000000
1E006A00  16160000  20200000  50000040  0E140B0E  10080000  00000000  00000000
1F041A04  26143B2F  2C230000  7180007E  12040410  04082104  04032704  04040803
2B2F3701  20232900  08080800  00080A0A  0A0A0A00  1619191E  0A14140A  20001C04
16360000  26440000  A000006A  0E46080E  080E1808  00000000  00000000  21023604
08080016  2A160E00  76000056  42082208  24080000  00000000  00000000  3B232201
2C1A1900  08080000  00000A0A  0A0A0A00  20110000  14140000  22006404  16160006
2A2A0000  9A00005A  0F390803  0E350803  00000000  00000000  23005604  08080000
3C180000  A0000054  68082808  00000000  00000000  00000000  24002C04  1A2A0000
30400000  A0000070  0F1E0408  0E143E08  00000000  00000000  25000604  40083C03
4E103F00  5E009DA0  0E121608  08080808  03030808  08180408  26003A04  16081600
2E162400  5E00A068  0F2E0812  080E2C08  00000000  00000000  27001C04  28082C00
4C180000  A0800064  48081808  28080000  00000000  00000000  28040604  16160000
22320000  A0000054  0E48080E  2C080000  00000000  00000000  48350001  38280000
08080000  08080A0A  0A0A0A00  2A2A1C1C  14141010  29028604  160C0000  202C0000
A000004C  0E3E0840  04080000  00000000  00000000  43D00001  322E0000  08080000
00000A0A  0A0A0A00  25210000  14140000  2A047004  25082C03  45220000  9D84006A
3E040832  08031108  00000000  00000000  4F2E3B01  3B232C00  08080800  00080A0A
0A0A0A0D  2D181820  14141414  2B008604  08080000  28320000  A000005A  3E085208
00000000  00000000  00000000  2C001004  08080000  28320000  A000005A  3E085208
00000000  00000000  00000000  2D027C04  0C080003  26330000  9D00005C  34040855
08030000  00000000  00000000  334A0001  26380000  08080000  00000A0A  0A0A0A00
1B2A0000  14140000  2E005604  08080000  2A300000  A000005A  42084E08  00000000
00000000  00000000  2F009A04  1A160003  32240000  90000059  0E320408  030E3B08
00000000  00000000  30009404  08080000  22360000  A0000058  34085C08  00000000
00000000  00000000  31021C04  08080000  28320000  A000005A  3E085208  00000000
00000000  00000000  38480001  2A360000  08080000  00000A0A  0A0A0A00  1E280000
14140000  32039A04  08080000  3A1E0000  A0000058  62082E08  00000000  00000000
00000000  55280001  40200000  08080000  08000A0A  0A0A0A00  30301600  14141400
33000C04  08080000  44160000  A000005A  78081808  00000000  00000000  00000000
34009004  08080000  38220000  A000005A  5E083208  00000000  00000000  00000000
35038004  3A082600  461A0000  A0800060  0E340408  18082A08  00000000  00000000
58283E01  421E2F00  08080800  00000A0A  0A0A0A00  32142200  14141400  39023C00
08080000  18160000  5000002E  28081808  00000000  00000000  00000000  261A0001
1D130000  08080000  00000A0A  0A0A0A00  13080000  140A0000  3A000A04  00000000
00000000  00000000  722E0000  00000000  00000000  00000000  6D006404  081A000D
36300000  93000073  5A080A0E  17040803  00000000  00000000  6E006004  2E162000
38260000  A0380B5E  0E4A0810  080E1208  00000000  00000000  6F006600  1A160003
1E1E0000  4D00003F  0E110408  030E0C08  00000000  00000000  70005404  1E280008
38360000  98000076  32120408  08202008  00000000  00000000  71001004  08080000
46160000  A000005C  7C081408  00000000  00000000  00000000  72000004  16160000
1E280000  A0000046  0E5E080E  16080000  00000000  00000000  73022C00  16160000
22220000  50000044  0E180B0E  0C080000  00000000  00000000  251B0000  1C140000
08080000  00000A0A  0A0A0A00  120C0000  0C000000  00000000  74005000  16160000  20200000
50000040  0E140B0E  10080000  00000000  00000000  75001400  08080000  16160000
```

FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

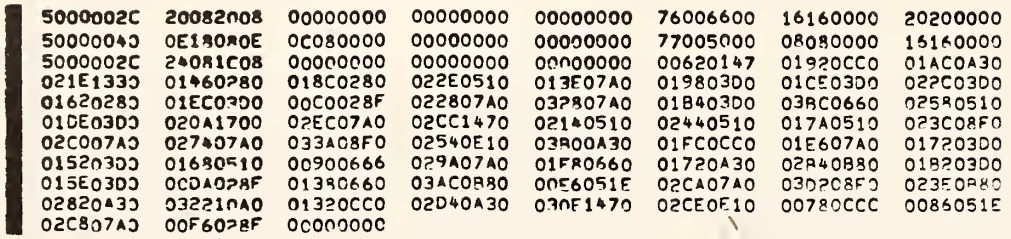


FIGURE 4.5.1. FORTRAN PATTERN PROGRAM (Continued)

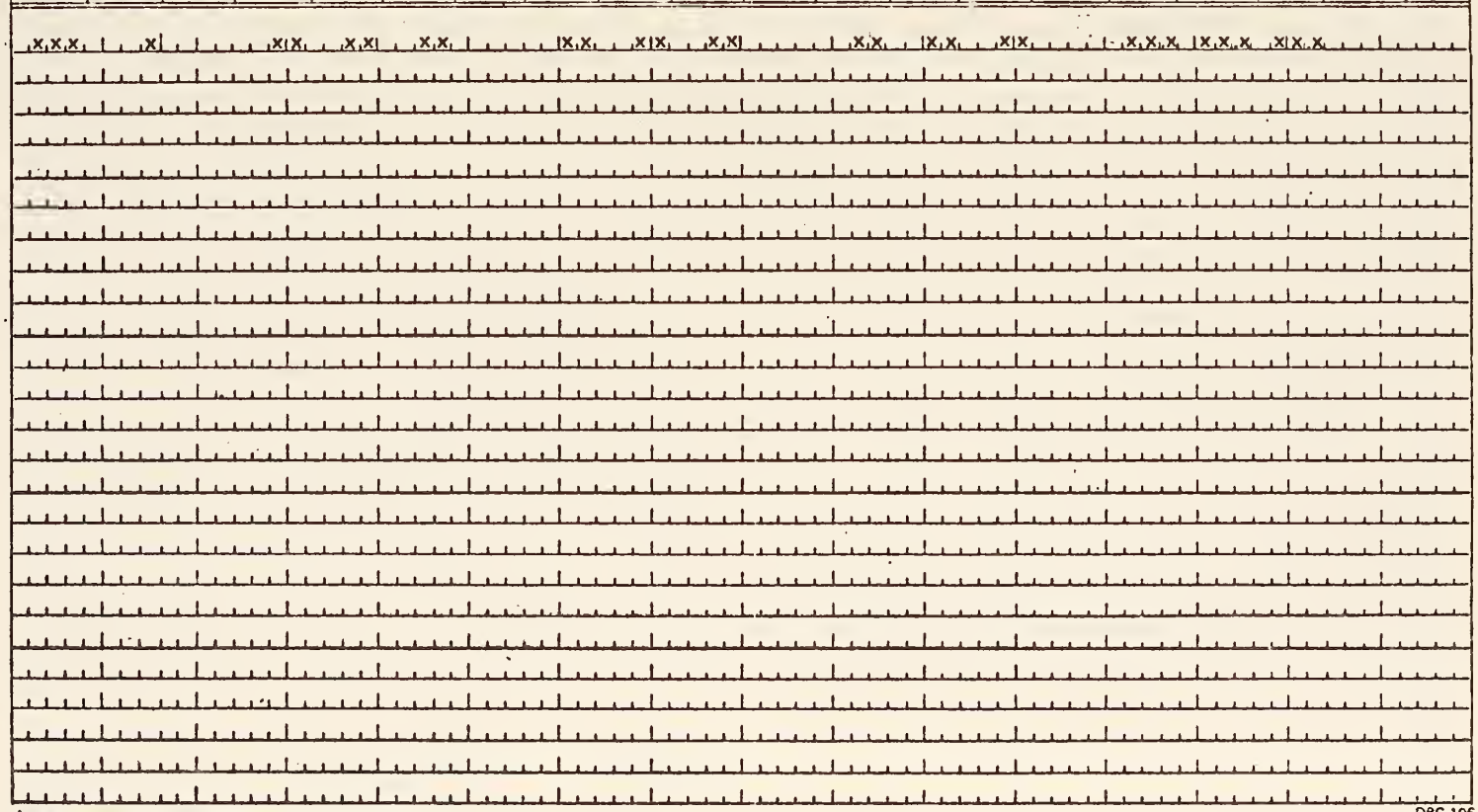
SPERRY DIVISION

GENERALIZED MANIFEST

DATA PROCESSING CENTER

PURPOSE	PREPARED BY	EXT.	DATE	PAGE 1 OF 5

CONT NO. (I)	CONT TYPE KPH		Phase Start Interval IPHST				Phase End Interval IPHENO				Adj Interval No. NADJ				Min. Adj. Interval* Duration (SEC) ADJMIN					
			A	B	C		A	B	C		A	B	C							
1 4	5 8	10 12	15 16	20	24	25 28	30 32	35 36	40	44	45 48	50 52	55 56	60	64	65 68	70 72	75 76	80	



SPERRY RAND *Leave Blank, if not given.

DPC 106

Figure 4.5.2. CONTROLLER INPUT CARDS

SPERRY DIVISION

GENERALIZED MANIFEST

DATA PROCESSING CENTER

PURPOSE	PREPARED BY	EXT.	DATE . :	PAGE OF

CONT NO. (I)	LINK NO. (L)	PHASE* (IP)		START GREEN INTER-VAL NSTG	END AMBER INTER-VAL NEND	START AMBER INTER-VAL NSTAM		LINK** DIREC-TION LDIR	LINK*** IMPOR-TANCE LMAJOR
1 4	5 8	10 12	15 16	20	24	25 28	30 32	35 36	40

45 50 55 60 65 70 75 80

DPC 106

SPERRY RAND *A1 = 1; A2 = 2; B1 = 3; B2 = 4; C1 = 5: ** OUT = 0; IN = 1: *** Minor Link = 0; Major Link = 1

Figure 4.5.3. (CRITICAL) LINK INPUT CARDS

SPERRY DIVISION

GENERALIZED MANIFEST

DATA PROCESSING CENTER

PURPOSE				PREPARED BY							EXT.	DATE			PAGE OF		
Controller No. (1)	CYCLE Length (secs)	NDIAL		1st Int. Length Secs	2nd Int.	3rd Int.	4th Int.	5th Int.	6th Int.	7th Int.	8th Int.	9th Int.	10th Int.	11th Int.	12th Int.	13th Int.	14th Int.	15th Int.	16th Int.
1	5	10	15	20		25	30	35	40		45	50	55	60		65	70	75	80

SPERRY RAND

DPC 106

Figure 4.5.4. CONTROLLER INTERVAL CARDS

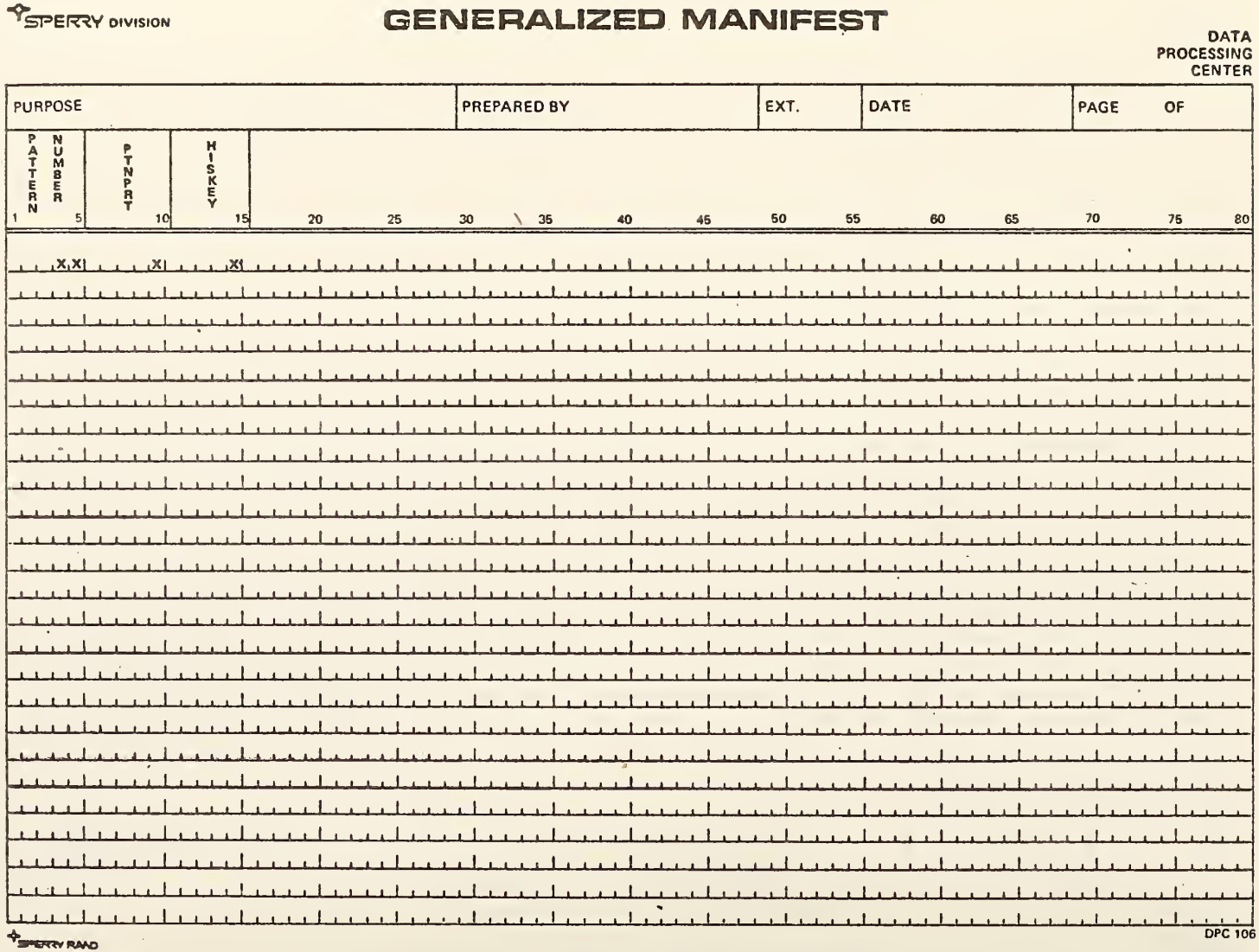


Figure 4.5.5. PATTERN NUMBER/OPTIONS CARD

SPERRY DIVISION

GENERALIZED MANIFEST

DATA PROCESSING CENTER

PURPOSE	PREPARED BY	EXT.	DATE	PAGE OF

CONT. #	OFFSET (SEC)	CIC TOD FLG	
1 5	10		15 20 25 30 35 40 45 50 65 60 65 70 75 80

X X X X X X

SPERRY RAND

DPC 106

Figure 4.5.6. OFFSET/CIC TOD FLAG CARDS

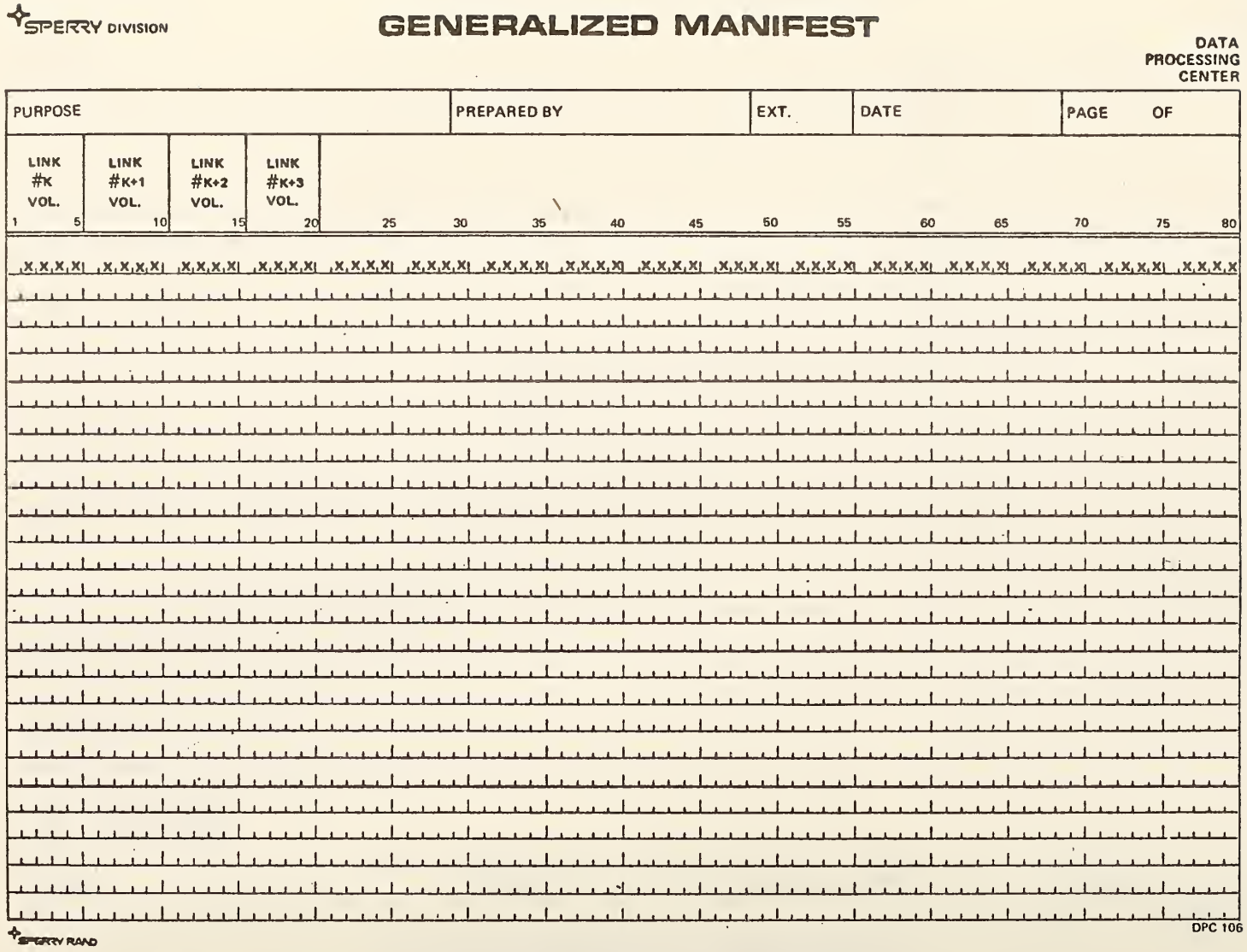


FIGURE 4.5.7. VOLUME HISTORY CARDS

SPERRY DIVISION

GENERALIZED MANIFEST

DATA PROCESSING CENTER

PURPOSE	PREPARED BY	EXT.	DATE	PAGE OF

LINK #K OCC.	LINK #K+1 OCC.	LINK #K+2 OCC.	LINK #K+3 OCC.

1 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80

SPERRY RAND NOTE: OCCUPANCY VALUES ARE IN (%) • 1000

DPC 106

FIGURE 4.5.8 OCCUPANCY HISTORY CARDS

4.6 FORTRAN Callable Subroutines

The FORTAN callable assembly language subroutines to be used in the second generation pattern optimization software are described in this section. The purpose of routines LDPAT (Section 4.6.1) and LDMOE (Section 4.6.2) is to reformat the available packed pattern and MOE data, respectively, into an unpacked singly dimensioned fixed point array. The purpose of routine STPAT (Section 4.6.3) is to reformat an unpacked singly dimensioned fixed point array of second generation pattern data into the available packed array. A listing of each of the subroutines is contained in Figure 4.6.1.

4.6.1 LDPAT

The purpose of LDPAT is to reformat pattern data from either the UTCS entry or working storage arrays, and store it in an array accessible by a FORTRAN routine.

The FORTRAN calling sequence for this subroutine is

CALL LDPAT (I, J, K)

where I is the UTCS Intersection Number
J is a Fixed Point Array (Dimension = 18)
K is a Flag to indicate the type of data contained in array J.
The code for K is

K = 1, entry storage data
K = 2, working storage data

The routine returns with

Array Element	Description	Scaling
J(1)	Not used	NA
J(2)	Not used	NA
J(3)	Not used	NA
J(4)	Offset	B1
J(5)	Cycle Length Code	B0
J(6)	No. of Adjustable Intervals	B0
J(7)	SUMA	B1
J(8)	SUMB	B1
J(9)	SUMC	B1
J(10)	SUMT	B1

Array Element	Description	Scaling
J(11)	GMINA	B1
J(12)	GMINB	B1
J(13)	GMINC	B1
J(14)	GMIN4	B1
J(15)	GAB	B1
J(16)	GBC	B1
J(17)	GABC	B1
J(18)	TKMIN	B1

4.6.2 STPAT

The purpose of STPAT is to accept pattern data from a FORTRAN routine, reformat the data and store it into either the UTCS entry or working storage arrays.

The FORTRAN calling sequence for this subroutine is

CALL STPAT (I, J, K)

where I, J and K are defined in the description of LDPAT with the exception that the first three array elements of J are entered with the following data:

Array Element	Description	Scaling
J(1)	Adjustable Interval Duration 1	B1
J(2)	Adjustable Interval Duration 2	B1
J(3)	Adjustable Interval Duration 3	B1

4.6.3 LDMOE

The purpose of LDMOE is to reformat UTCS 15 minute accumulated MOEs and store them in an array accessible by a FORTRAN routine.

The FORTRAN calling sequence for this subroutine is

CALL LDMOE (I, J)

where I is the Link Number
J is a Fixed Point Array (Dimension = 8)

The routine returns with

Array Element	Description	Scaling
J(1)	Link Length	B0
J(2)	Volume (veh/hr)	B0
J(3)	Queue (veh)	B0
J(4)	Occupancy (percent)	B0
J(5)	Number of Stops	B0
J(6)	Travel Time (sec/veh)	B5
J(7)	Average Speed (MPH)	B0
J(8)	Delay (sec/veh)	B0

Note that all MOEs are 15 minute accumulated totals.

```
C00   11:21  OCT 20, '72                                                                    1
      1                *
      2                *          THE PURPOSE OF LDPAT IS TO REFORMAT PATTERN DATA
      3                *     FROM EITHER THE UTCS ENTRY OR WORKING STORAGE ARRAYS, AND
      4                *     STORE IT IN AN ARRAY ACCESSIBLE BY A FORTRAN ROUTINE.
      5                *
      6                *          THE FORTRAN CALLING SEQUENCE:
      7                *
      8                *               CALL LDPAT(I,J,K)
      9                *               I = UTCS INTERSECTION NUMBER
     10                *               J = FIXED POINT ARRAY(DIMENSION = 18)
     11                *               K = TYPE OF DATA: 1 = ENTRY STORAGE DATA
     12                *                                 2 = WORKING STORAGE DATA
     13                               DEF     LDPAT
     14                               REF     CYCLC
     15                               REF     ENTRYOFF
     16                               REF     GABBCABC
     17                               REF     GMINABC4
     18                               REF     NUMVAR
     19                               REF     SUMABCT
     20                               REF     WRKOFF
     21        00000000       R0      EQU     0
     22        00000001       R1      EQU     1
     23        00000002       R2      EQU     2
     24        00000003       R3      EQU     3
     25        00000004       R4      EQU     4
     26        00000005       R5      EQU     5
     27        00000006       R6      EQU     6
     28        00000007       R7      EQU     7
     29        00000008       R8      EQU     8
     30        00000009       R9      EQU     9
     31        0000000A       R10     EQU     10
     32        0000000B       R11     EQU     11
     33        0000000C       R12     EQU     12
     34        0000000D       R13     EQU     13
     35        0000000E       R14     EQU     14
     36        0000000F       R15     EQU     15
     37                       *
     38                       *
     39  01 00000             LDPAT   RES     0                 * ENTRANCE
     40  01 00000  02200000 A        LCI     0
     41  01 00001  28000028          STM,R0  REGSAV            * SAVE ALL REGISTERS
     42  01 00002  4610000F A        XW,R1   R15
     43  01 00003  32220000 A        LW,R2   0,R1              * ADDRESS OF I
     44  01 00004  48200038          AND,R2  =X'FFFFF'         * MASK OUT OP CODE
     45  01 00005  32320001 A        LW,R3   1,R1              * ADDRESS OF J
     46  01 00006  48300038          AND,R3  =X'FFFFF'         * MASK OUT OP CODE
     47  01 00007  32420002 A        LW,R4   2,R1              * ADDRESS OF K
     48  01 00008  48400038          AND,R4  =X'FFFFF'         * MASK OUT OP CODE
     49  01 00009  32540000 A        LW,R5   0,R2              * I = CONTROLLER NUMBER
     50  01 0000A  205FFFFF A        AI,R5   -1                * INDEX = I - 1
     51  01 00008  32A80000 A        LW,R10  0,R4
```

FIGURE 4.6.1 FORTRAN CALLABLE SUBROUTINE

```
C00   11:21  OCT 20, '72                                                                    2
      51   01 0000C   21A00001 A            CI,R10    1                 * K = 1                 LDPAT
      52   01 00000   68300010              BE        ENTDATA           * YES = BRANCH          LDPAT
      53   01 0000E   72AA0000 X            LB,R10    WRK0FF,R5         * OFFSET = SCALED B1    LDPAT
      54   01 0000F   68000011              B         $+2                                       LDPAT
      55   01 00010   72AA0000 X  ENTDATA   LB,R10    ENTRY0FF,R5       * OFFSET = SCALED B1    LDPAT
      56   01 00011   35A60003 A            STW,R10   3,R3              * STORE AT J(4)         LDPAT
      57   01 00012   72AA0000 X            LB,R10    CYCLC,R5          * CYCLE LENGTH CODE = B0 LDPAT
      58   01 00013   35A60004 A            STW,R10   4,R3              * STORE AT J(5)         LDPAT
      59   01 00014   72AA0000 X            LB,R10    NUMVAR,R5         * NUMBER OF ADJUSTABLE INTER LDPAT
      60                        *                                      * VALS = SCALED B0      LDPAT
      61   01 00015   35 60005 A            STW,R10   5,R3              * STORE AT J(6)         LDPAT
      62   01 00016   32BA0000 X            LW,R11    SUMABCT,R5        * SUM A(BYTE 0), SUM B(BYTE LDPAT
      63                        *                                      * 1), SUM C(BYTE 2), SUM T LDPAT
      64                        *                                      * (BYTE 3) = ALL SCALED B1 LDPAT
      65   01 00017   20300006 A            AI,R3     6                 * INCREMENT ADDRESS OF J LDPAT
      66   01 00018   6A900021              BAL,R9    UNPACK                                    LDPAT
      67   01 00019   32BA0000 X            LW,R11    GMINABC4,R5       * GMIN A(BYTE 0), GMIN B(BYT LDPAT
      68                        *                                      * E 1), GMIN C(BYTE 2), GMIN LDPAT
      69                        *                                      * 4(BYTE 3) = ALL SCALED B1 LDPAT
      70   01 0001A   6A900021              BAL,R9    UNPACK                                    LDPAT
      71   01 00018   32BA0000 X            LW,R11    GABBCABC,R5       * GAB(BYTE 0), GBC(BYTE 1), LDPAT
      72                        *                                      * GABC(BYTE 2), TKMIN(BYTE 3 LDPAT
      73                        *                                      * ) = ALL SCALED B1     LDPAT
      74   01 0001C   6A900021              BAL,R9    UNPACK                                    LDPAT
      75   01 0001D   02200000 A            LCI       0                                         LDPAT
      76   01 0001E   2A000028              LM,R0     REGSAV            * RESTORE ALL REGISTERS LDPAT
      77   01 0001F   30F0000E A            AW,R15    R14                                       LDPAT
      78   01 00020   E800000F A            B         *R15              * EXIT                  LDPAT
      79                        *                                                              LDPAT
      80   01 00021             UNPACK      RES       0                                         LDPAT
      81   01 00021   22600004 A            LI,R6     4                 * LOOP COUNT            LDPAT
      82   01 00022   25A00108 A  LOOP1     SLD,R10   8                                       LDPAT
      83   01 00023   48A00039              AND,R10   =X'FF'                                    LDPAT
      84   01 00024   35A60000 A            STW,R10   0,R3              * STORE INTO ARRAY J    LDPAT
      85   01 00025   20300001 A            AI,R3     1                                       LDPAT
      86   01 00026   64600022              BDR,R6    LOOP1             * LOOP UNTIL 4 BYTES ARE UN- LDPAT
      87                        *                                      * PACKED                LDPAT
      88   01 00027   E8000009 A            B         *R9               * RETURN                LDPAT
      89   01 00028             REGSAV      RES       16                * STORAGE FOR 16-REGISTERS LDPAT
      90                                    END
           01 00038   000FFFFF A
           01 00039   000000FF A
```

FIGURE 4.6.1. FORTRAN CALLABLE SUBROUTINE (Continued)

```
COO    11122  OCT 20, '72                                                                                    1
       1                    *                    THE PURPOSE OF STPAT IS TO ACCEPT PATTERN DATA FROM      STPAT
       2                    *          A FORTRAN ROUTINE, REFORMAT THE DATA AND STORE IT INTO EITHER      STPAT
       3                    *          THE UTCS ENTRY OR WORKING STORAGE ARRAYS                           STPAT
       4                    *                                                                             STPAT
       5                    *                    THE FORTRAN CALLING SEQUENCE:                            STPAT
       6                    *                                                                             STPAT
       7                    *                         CALL STPAT(I,J,K)                                   STPAT
       8                    *                         I = UTCS INTERSECTION NUMBER                        STPAT
       9                    *                         J = FIXED POINT ARRAY(DIMENSION = 18)               STPAT
      10                    *                         K = TYPE OF DATA: 1 = ENTRY STORAGE DATA            STPAT
      11                    *                                           2 = WORKING STORAGE DATA          STPAT
      12                                        DEF     STPAT                                               STPAT
      13                                        REF     CYCLC                                               STPAT
      14                                        REF     ENTRYINT                                            STPAT
      15                                        REF     ENTRYOFF                                            STPAT
      16                                        REF     GABBCABC                                            STPAT
      17                                        REF     GMINABC4                                            STPAT
      18                                        REF     INTDUM                                              STPAT
      19                                      REF     NUMVAR
      20                                        REF     SUMABCT                                             STPAT
      21                                        REF     TKM                                                 STPAT
      22                                        REF     VARINT                                              STPAT
      23                                        REF     WRKOFF                                              STPAT
      24            00000000          R0      EQU     0                                                   STPAT
      25            00000001          R1      EQU     1                                                   STPAT
      26            00000002          R2      EQU     2                                                   STPAT
      27            00000003          R3      EQU     3                                                   STPAT
      28            00000004          R4      EQU     4                                                   STPAT
      29            00000005          R5      EQU     5                                                   STPAT
      30            00000006          R6      EQU     6                                                   STPAT
      31            00000007          R7      EQU     7                                                   STPAT
      32            00000008          R8      EQU     8                                                   STPAT
      33            00000009          R9      EQU     9                                                   STPAT
      34            0000000A          R10     EQU     10                                                  STPAT
      35            0000000B          R11     EQU     11                                                  STPAT
      36            0000000C          R12     EQU     12                                                  STPAT
      37            0000000D          R13     EQU     13                                                  STPAT
      38            0000000E          R14     EQU     14                                                  STPAT
      39            0000000F          R15     EQU     15                                                  STPAT
      40                                    *                                                             STPAT
      41                                    *                                                             STPAT
      42   01 00000                   STPAT   RES     0               * ENTRANCE                          STPAT
      43   01 00000   02200000 A             LCI     0                                                   STPAT
      44   01 00001   28000058              STM,R0  REGSAV          * SAVE ALL REGISTERS                  STPAT
      45   01 00002   4610000F A             XW,R1   R15                                                 STPAT
      46   01 00003   32220000 A             LW,R2   0,R1            * ADDRESS OF I                      STPAT
      47   01 00004   48200068              AND,R2  =X'FFFFFF'      * MASK OUT OP CODE                    STPAT
      48   01 00005   32320001 A             LW,R3   1,R1            * ADDRESS OF J                      STPAT
      49   01 00006   48300068              AND,R3  =X'FFFFFF'      * MASK OUT OP CODE                    STPAT
      50   01 00007   32420002 A             LW,R4   2,R1            * ADDRESS OF K                      STPAT
```

FIGURE 4.6.1. FORTRAN CALLABLE SUBROUTINE (Continued)

```
C00   11122  OCT 20, '72                                                                    2
      51   01 00008   48400068          AND,R4    =X'FFFFFF'      * MASK OUT OP CODE          STPAT
      52   01 00009   32540000 A        LW,R5     0,R2            * I = CONTROLLER NUMBER     STPAT
      53   01 0000A   205FFFFF A        AI,R5     -1              * INDEX = I - 1             STPAT
      54   01 0000B   32600005 A        LW,R6     R5                                          STPAT
      55   01 0000C   25600002 A        SLS,R6    2               * 4*I                       STPAT
      56   01 0000D   727C0000 X        LB,R7     VARINT,R6       * INTERVAL NUMBER           STPAT
      57   01 0000E   32A80000 A        LW,R10    0,R4                                        STPAT
      58   01 0000F   21A00001 A        CI,R10    1               * K = 1                     STPAT
      59   01 00010   68300046          BE        ENTDATA         * YES = BRANCH              STPAT
      60   01 00011   32400006 A        LW,R4     R6                                          STPAT
      61   01 00012   25400002 A        SLS,R4    2               * 16*I                      STPAT
      62   01 00013   30700004 A        AW,R7     R4              * 16*I + INTERVAL NUMBER    STPAT
      63   01 00014   32A60000 A        LW,R10    0,R3            * ADJUSTABLE INTERVAL       STPAT
      64                                                          * DURATION NUMBER 1         STPAT
      65   01 00015   75AE0000 X        STB,R10   INTDUR,R7                                   STPAT
      66   01 00016   20600001 A        AI,R6     1                                           STPAT
      67   01 00017   727C0000 X        LB,R7     VARINT,R6       * INTERVAL NUMBER           STPAT
      68   01 00018   30700004 A        AW,R7     R4              * 16*I + INTERVAL NUMBER    STPAT
      69   01 00019   32A60001 A        LW,R10    1,R3            * ADJUSTABLE INTERVAL       STPAT
      70                                                          * DURATION NUMBER 2         STPAT
      71   01 0001A   75AE0000 X        STB,R10   INTDUR,R7                                   STPAT
      72   01 0001B   20600001 A        AI,R6     1                                           STPAT
      73   01 0001C   727C0000 X        LB,R7     VARINT,R6       * INTERVAL NUMBER           STPAT
      74   01 0001D   30700004 A        AW,R7     R4              * 16*I + INTERVAL NUMBER    STPAT
      75   01 0001E   32A60002 A        LW,R10    2,R3            * ADJUSTABLE INTERVAL       STPAT
      76                                                          * DURATION NUMBER 3         STPAT
      77   01 0001F   75AE0000 X        STB,R10   INTDUR,R7                                   STPAT
      78   01 00020   32A60003 A        LW,R10    3,R3            * OFFSET                    STPAT
      79   01 00021   75AA0000 X        STB,R10   WRKOFF,R5                                   STPAT
      80   01 00022   32A60004 A CONTINUE LW,R10   4,R3           * CYCLE LENGTH CODE         STPAT
      81   01 00023   75AA0000 X        STB,R10   CYCLC,R5                                    STPAT
      82   01 00024   32A60005 A        LW,R10    5,R3            * NUMBER OF ADJUSTABLE      STPAT
      83                                                          * INTERVALS                 STPAT
      84   01 00025   75AA0000 X        STB,R10   NUMVAR,R5                                   STPAT
      85   01 00026   32B60009 A        LW,R11    9,R3            * SUM T                     STPAT
      86   01 00027   25A00378 A        SCD,R10   =8                                          STPAT
      87   01 00028   32B60008 A        LW,R11    8,R3            * SUM C                     STPAT
      88   01 00029   25A00378 A        SCD,R10   =8                                          STPAT
      89   01 0002A   32B60007 A        LW,R11    7,R3            * SUM B                     STPAT
      90   01 0002B   25A00378 A        SCD,R10   =8                                          STPAT
      91   01 0002C   32B60006 A        LW,R11    6,R3            * SUM A                     STPAT
      92   01 0002D   25A00378 A        SCD,R10   =8                                          STPAT
      93   01 0002E   35AA0000 X        STW,R10   SUMABCT,R5                                  STPAT
      94   01 0002F   32B60000 A        LW,R11    13,R3           * GMIN A                    STPAT
      95   01 00030   25A00378 A        SCD,R10   =8                                          STPAT
      96   01 00031   32B6000C A        LW,R11    12,R3           * GMIN C                    STPAT
      97   01 00032   25A00378 A        SCD,R10   =8                                          STPAT
      98   01 00033   32B6000B A        LW,R11    11,R3           * GMIN B                    STPAT
      99   01 00034   25A00378 A        SCD,R10   =8                                          STPAT
     100   01 00035   32B6000A A        LW,R11    10,R3           * GMIN A                    STPAT
```

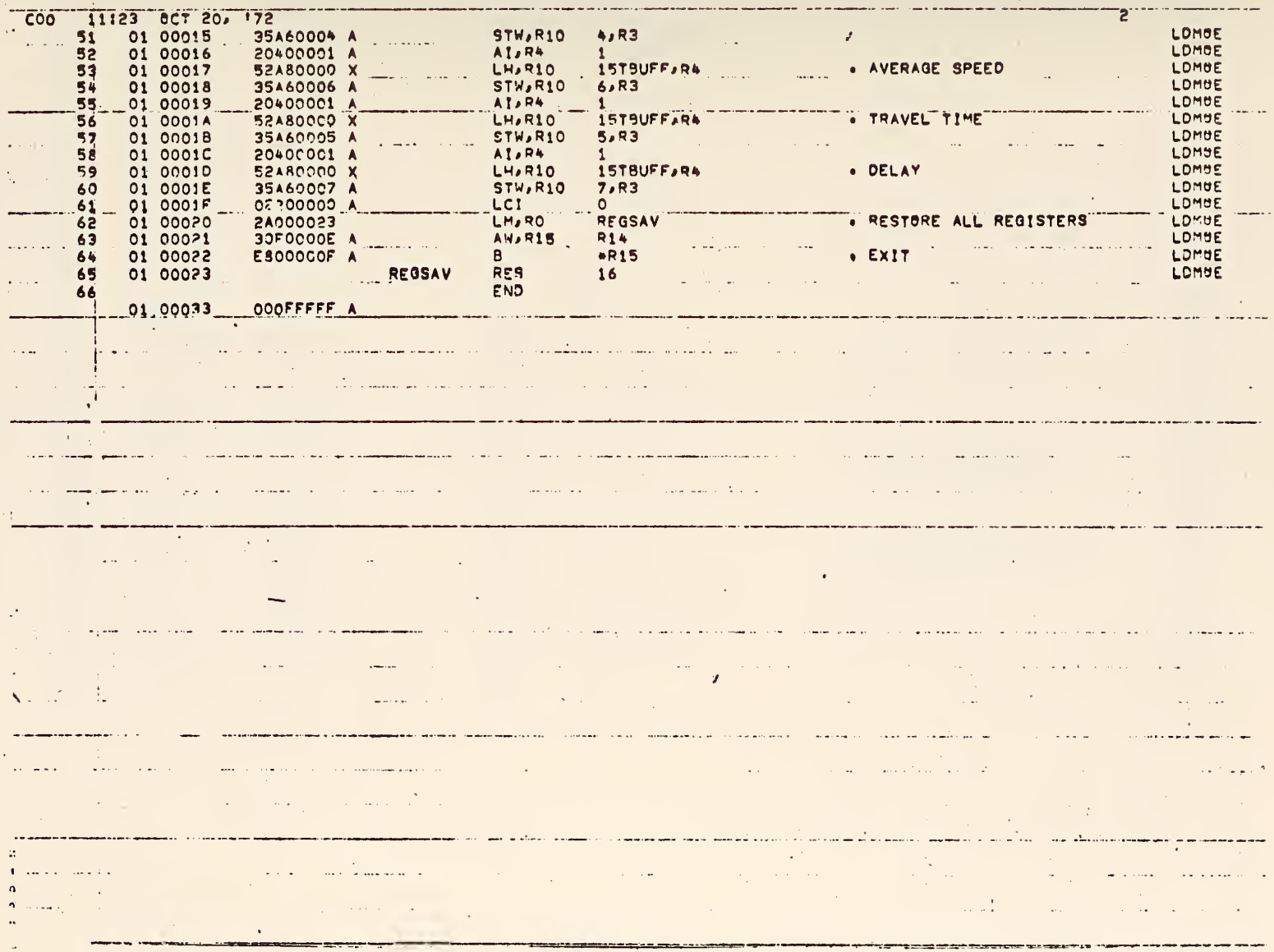
FIGURE 4.6.1. FORTRAN CALLABLE SUBROUTINE (Continued)

```
COO   11:22  OCT 20, '72                                                                    3
      101   01 00036   25A00378 A          SCD,R10   -8                                    STPAT
      102   01 00037   35AA0000 X          STW,R10   GMINABC4,R5                           STPAT
      103   01 00038   32B60011 A          LW,R11    17,R3          • TKMIN                STPAT
      104   01 00039   75BA0000 X          STB,R11   TKM,R5                                STPAT
      105   01 0003A   25A00378 A          SCD,R10   -8                                    STPAT
      106   01 0003B   32B60010 A          LW,R11    16,R3          • GABC                 STPAT
      107   01 0003C   25A00378 A          SCD,R10   -8                                    STPAT
      108   01 0003D   32B6000F A          LW,R11    15,R3          • GBC                  STPAT
      109   01 0003E   25A00378 A          SCD,R10   -8                                    STPAT
      110   01 0003F   32B6000E A          LW,R11    14,R3          • GAB                  STPAT
      111   01 00040   25A00378 A          SCD,R10   -8                                    STPAT
      112   01 00041   35AA0000 X          STW,R10   GABBCABC,R5                           STPAT
      113   01 00042   02200000 A          LCI       0                                     STPAT
      114   01 00043   2A000058            LM,R0     REGSAV         • RESTORE ALL REGISTERS STPAT
      115   01 00044   30F0000E A          AW,R15    R14                                   STPAT
      116   01 00045   E800000F A          B         *15            • EXIT                 STPAT
      117   01 00046              ENTDATA   RES       0                                     STPAT
      118   01 00046   32400006 A          LW,R4     R6                                    STPAT
      119   01 00047   25400002 A          SLS,R4    2              • 16*I                 STPAT
      120   01 00048   30700004 A          AW,R7     R4             • 16*I + INTERVAL NUMBER STPAT
      121   01 00049   32A60000 A          LW,R10    0,R3           • ADJUSTABLE INTERVAL  STPAT
      122                                                           • DURATION NUMBER 1    STPAT
      123   01 0004A   75AE0000 X          STB,R10   ENTRYINT,R7                           STPAT
      124   01 0004B   20600001 A          AI,R6     1                                     STPAT
      125   01 0004C   727C0000 X          LB,R7     VARINT,R6      • INTERVAL NUMBER      STPAT
      126   01 0004D   30700004 A          AW,R7     R4             • 16*I + INTERVAL NUMBER STPAT
      127   01 0004E   32A60001 A          LW,R10    1,R3           • ADJUSTABLE INTERVAL  STPAT
      128                                                           • DURATION NUMBER 2    STPAT
      129   01 0004F   75AE0000 X          STB,R10   ENTRYINT,R7                           STPAT
      130   01 00050   20600001 A          AI,R6     1                                     STPAT
      131   01 00051   727C0000 X          LB,R7     VARINT,R6      • INTERVAL NUMBER      STPAT
      132   01 00052   30700004 A          AW,R7     R4             • 16* I + INTERVAL NUMBER STPAT
      133   01 00053   32A60002 A          LW,R10    2,R3           • ADJUSTABLE INTERVAL  STPAT
      134                                                           • DURATION NUMBER 3    STPAT
      135   01 00054   75AE0000 X          STB,R10   ENTRYINT,R7                           STPAT
      136   01 00055   32A60003 A          LW,R10    3,R3           • OFFSET               STPAT
      137   01 00056   75AA0000 X          STB,R10   ENTRYOFF,R5                           STPAT
      138   01 00057   68000022            B         CONTINUE                              STPAT
      139   01 00058              REGSAV    RES       16                                    STPAT
      140                                   END
            01 00068   000FFFFF A
```

FIGURE 4.6.1. FORTRAN CALLABLE SUBROUTINE (Continued)

```
COO   11:23  OCT 20, '72                                                                    1
                                *
                                *                THE PURPOSE OF LDMODE IS TO REFORMAT UTCS 15 MINUTE     LDMOE
                                *  ACCUMULATED MOE'S AND STORE IT IN AN ARRAY ACCESSIBLE BY A           LDMOE
                                *  FORTRAN ROUTINE                                                      LDMOE
                                *                                                                       LDMOE
                                *                THE FORTRAN CALLING SEQUENCE:                          LDMOE
                                *                                                                       LDMOE
                                *                     CALL LDMOE(I,J)                                   LDMOE
                                *                     I = LINK NUMBER                                   LDMOE
                                *                     J = FIXED POINT ARRAY(DIMENSION = 8)              LDMOE
                                *                                                                       LDMOE
                                          DEF       LDMOE                                               LDMOE
                                          REF       D                                                   LDMOE
                                          REF       15TBUFF                                             LDMOE
                00000000        R0        EQU       0                                                   LDMOE
                00000001        R1        EQU       1                                                   LDMOE
                00000002        R2        EQU       2                                                   LDMOE
                00000003        R3        EQU       3                                                   LDMOE
                00000004        R4        EQU       4                                                   LDMOE
                00000005        R5        EQU       5                                                   LDMOE
                00000006        R6        EQU       6                                                   LDMOE
                00000007        R7        EQU       7                                                   LDMOE
                00000008        R8        EQU       8                                                   LDMOE
                00000009        R9        EQU       9                                                   LDMOE
                0000000A        R10       EQU       10                                                  LDMOE
                0000000B        R11       EQU       11                                                  LDMOE
                0000000C        R12       EQU       12                                                  LDMOE
                0000000D        R13       EQU       13                                                  LDMOE
                0000000E        R14       EQU       14                                                  LDMOE
                0000000F        R15       EQU       15                                                  LDMOE
01 00000                        LDMOE     RES       0           * ENTERANCE                             LDMOE
01 00000  02200000 A                      LCI       0                                                   LDMOE
01 00001  28000023                        STM,R0    REGSAV      * SAVE ALL REGISTERS                    LDMOE
01 00002  4610000F A                      XW,R1     R15                                                 LDMOE
01 00003  32220000 A                      LW,R2     0,R1        * ADDRESS OF I                          LDMOE
01 00004  48200033                        AND,R2    =X'FFFFF'   * MASK OUT OP CODE                      LDMOE
01 00005  32320001 A                      LW,R3     1,R1        * ADDRESS OF J                          LDMOE
01 00006  48300033                        AND,R3    =X'FFFFF'   * MASK OUT OP CODE                      LDMOE
01 00007  32440000 A                      LW,R4     0,R2        * I = LINK NUMBER                       LDMOE
01 00008  204FFFFF A                      AI,R4     -1                                                  LDMOE
01 00009  25400003 A                      SLS,R4    3           * INDEX = (I-1)*8                       LDMOE
01 0000A  20400009 A                      AI,R4     9                                                   LDMOE
01 0000B  52A80000 X                      LH,R10    15TBUFF,R4  * VOLUME                                LDMOE
01 0000C  35A60001 A                      STW,R10   1,R3                                                LDMOE
01 0000D  20400001 A                      AI,R4     1                                                   LDMOE
01 0000E  52A80000 X                      LH,R10    15TBUFF,R4  * OCCUPANCY                             LDMOE
01 0000F  35A60003 A                      STW,R10   3,R3                                                LDMOE
01 00010  20400001 A                      AI,R4     1                                                   LDMOE
01 00011  52A80000 X                      LH,R10    15TBUFF,R4  * QUEUES                                LDMOE
01 00012  35A60002 A                      STW,R10   2,R3                                                LDMOE
01 00013  20400001 A                      AI,R4     1                                                   LDMOE
01 00014  52A80000 X                      LH,R10    15TBUFF,R4  * STOPS                                 LDMOE
```

FIGURE 4.6.1. FORTRAN CALLABLE SUBROUTINE (Continued)

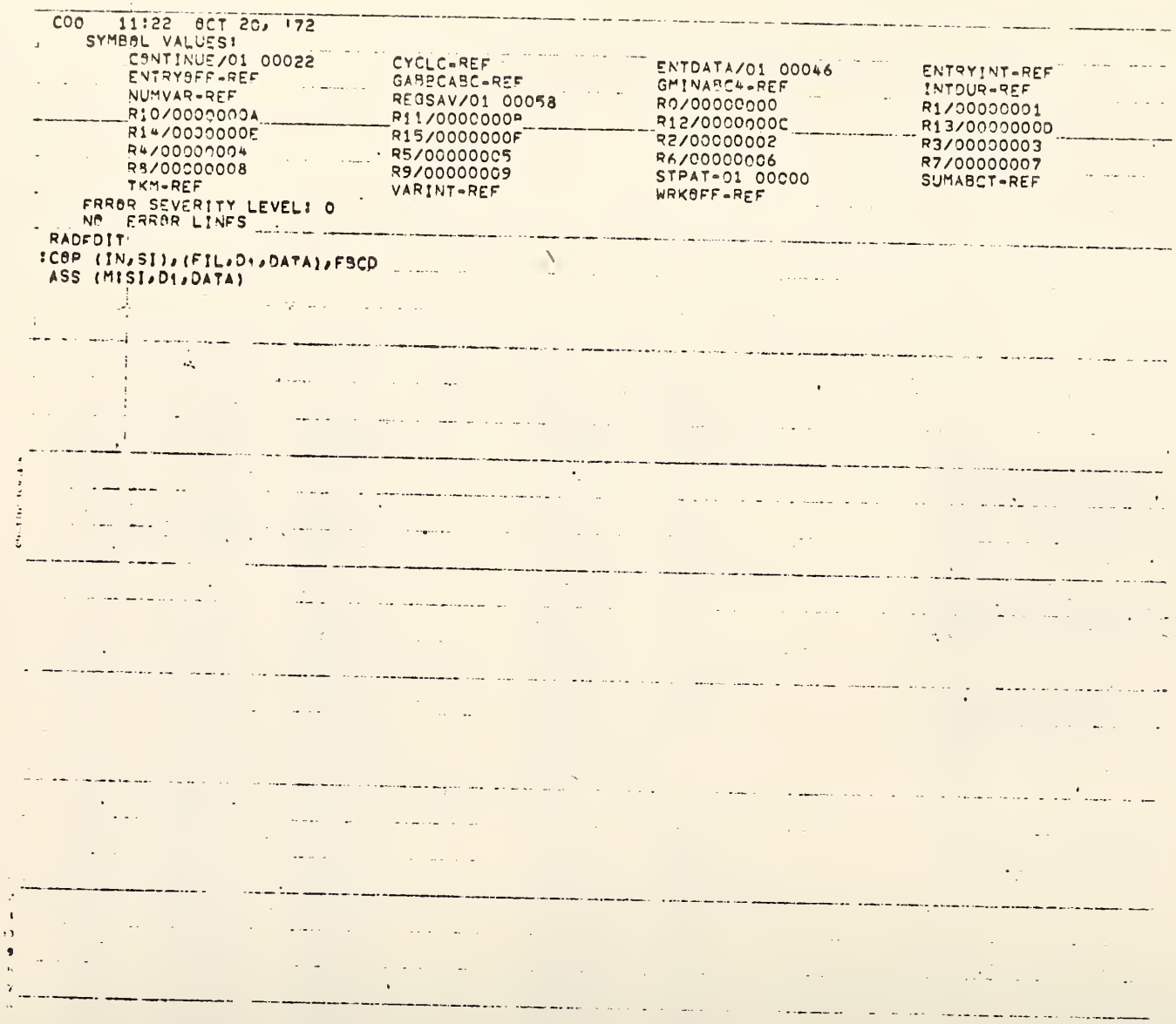


```
C00   11:23  OCT 20, '72                                                                    2
      51    01 00015    35A60004 A          STW,R10   4,R3                                  LDMBE
      52    01 00016    20400001 A          AI,R4     1                                     LDMBE
      53    01 00017    52A80000 X          LH,R10    15TBUFF,R4      * AVERAGE SPEED       LDMBE
      54    01 00018    35A60006 A          STW,R10   6,R3                                  LDMBE
      55    01 00019    20400001 A          AI,R4     1                                     LDMBE
      56    01 0001A    52A80000 X          LH,R10    15TBUFF,R4      * TRAVEL TIME         LDMBE
      57    01 0001B    35A60005 A          STW,R10   5,R3                                  LDMBE
      58    01 0001C    20400001 A          AI,R4     1                                     LDMBE
      59    01 0001D    52A80000 X          LH,R10    15TBUFF,R4      * DELAY               LDMBE
      60    01 0001E    35A60007 A          STW,R10   7,R3                                  LDMBE
      61    01 0001F    02000000 A          LCI       0                                     LDMBE
      62    01 00020    2A000023            LM,R0     REGSAV          * RESTORE ALL REGISTERS LDMBE
      63    01 00021    30F0000E A          AW,R15    R14                                   LDMBE
      64    01 00022    E8000000 A          B         *R15            * EXIT                LDMBE
      65    01 00023                REGSAV    RES       16                                    LDMBE
      66                                    END
            01 00023    000FFFFF A
```

FIGURE 4.6.1. FORTRAN CALLABLE SUBROUTINE (Continued)

```
C00   11:22  OCT 20, 172                                                    3
    101   01 00036   25A00378 A          SCD,R10   -8                                STPAT
    102   01 00037   35AA0000 X          STW,R10   GMINABC4,R5                       STPAT
    103   01 00038   32B60011 A          LW,R11    17,R3      * TKMIN               STPAT
    104   01 00039   75BA0000 X          STB,R11   TKM,R5                            STPAT
    105   01 0003A   25A00378 A          SCD,R10   -8                                STPAT
    106   01 0003B   32B60010 A          LW,R11    16,R3      * GABC                STPAT
    107   01 0003C   25A00378 A          SCD,R10   -8                                STPAT
    108   01 0003D   32B6000F A          LW,R11    15,R3      * GBC                 STPAT
    109   01 0003E   25A00378 A          SCD,R10   -8                                STPAT
    110   01 0003F   32B6000E A          LW,R11    14,R3      * GAB                 STPAT
    111   01 00040   25A00378 A          SCD,R10   -8                                STPAT
    112   01 00041   35AA0000 X          STW,R10   GABBCABC,R5                       STPAT
    113   01 00042   02000000 A          LCI       0                                 STPAT
    114   01 00043   2A000058            LM,R0     REGSAV     * RESTORE ALL REGISTERS STPAT
    115   01 00044   30F0000E A          AW,R15    R14                               STPAT
    116   01 00045   E800000F A          B         *15        * EXIT                 STPAT
    117   01 00046              ENTDATA   RES       0                                 STPAT
    118   01 00046   32400006 A          LW,R4     R6                                STPAT
    119   01 00047   25400002 A          SLS,R4    2          * 16*I                 STPAT
    120   01 00048   30700004 A          AW,R7     R4         * 16*I + INTERVAL NUMBER STPAT
    121   01 00049   32A60000 A          LW,R10    0,R3       * ADJUSTABLE INTERVAL  STPAT
    122                        *                               * DURATION NUMBER 1   STPAT
    123   01 0004A   75AE0000 X          STB,R10   ENTRYINT,R7                       STPAT
    124   01 0004B   20600001 A          AI,R6     1                                 STPAT
    125   01 0004C   727C0000 X          LB,R7     VARINT,R6  * INTERVAL NUMBER      STPAT
    126   01 0004D   30700004 A          AW,R7     R4         * 16*I + INTERVAL NUMBER STPAT
    127   01 0004E   32A60001 A          LW,R10    1,R3       * ADJUSTABLE INTERVAL  STPAT
    128                        *                               * DURATION NUMBER 2   STPAT
    129   01 0004F   75AE0000 X          STB,R10   ENTRYINT,R7                       STPAT
    130   01 00050   20600001 A          AI,R6     1                                 STPAT
    131   01 00051   727C0000 X          LB,R7     VARINT,R6  * INTERVAL NUMBER      STPAT
    132   01 00052   30700004 A          AW,R7     R4         * 16* I + INTERVAL NUMBER STPAT
    133   01 00053   32A60002 A          LW,R10    2,R3       * ADJUSTABLE INTERVAL  STPAT
    134                        *                               * DURATION NUMBER 3   STPAT
    135   01 00054   75AE0000 X          STB,R10   ENTRYINT,R7                       STPAT
    136   01 00055   32A60003 A          LW,R10    3,R3       * OFFSET              STPAT
    137   01 00056   75AA0000 X          STB,R10   ENTRYOFF,R5                       STPAT
    138   01 00057   68000022            B         CONTINUE                          STPAT
    139   01 00058              REGSAV    RES       16                                STPAT
    140                        END
          01 00068   000FFFFF A
```

FIGURE 4.6.1. FORTRAN CALLABLE SUBROUTINE (Continued)



```
 C00   11:22  0CT 20, '72
    SYMB0L VALUES:
        C9NTINUE/01 00022       CYCLC=REF               ENTDATA/01 00046        ENTRYINT=REF
        ENTRY0FF=REF            GABBCABC=REF            GMINABC4=REF            INTDUR=REF
        NUMVAR=REF              REGSAV/01 00058         R0/00000000             R1/00000001
        R10/0000000A            R11/0000000B            R12/0000000C            R13/0000000D
        R14/0000000E            R15/0000000F            R2/00000002             R3/00000003
        R4/00000004             R5/00000005             R6/00000006             R7/00000007
        R8/00000008             R9/00000009             STPAT=01 00000          SUMABCT=REF
        TKM=REF                 VARINT=REF              WRK0FF=REF
    ERR0R SEVERITY LEVEL: 0
    N0  ERR0R LINES
 RADFDIT
:C0P (IN,SI),(FIL,D1,DATA),FSCD
 ASS (MISI,D1,DATA)
```

FIGURE 4.6.1. FORTRAN CALLABLE SUBROUTINE (Continued)

```
COO   11:23  OCT 20, '72                                                                    1
      1                    *          THE PURPOSE OF LDMODE IS TO REFORMAT UTCS 15 MINUTE    LDMODE
      2                    *     ACCUMULATED MEE'S AND STORE IT IN AN ARRAY ACCESSIBLE BY A  LDMODE
      3                    *     FORTRAN ROUTINE                                            LDMODE
      4                    *                                                                LDMODE
      5                    *          THE FORTRAN CALLING SEQUENCE:                         LDMODE
      6                    *                                                                LDMODE
      7                    *               CALL LDMODE(I,J)                                 LDMODE
      8                    *               I = LINK NUMBER                                  LDMODE
      9                    *               J = FIXED POINT ARRAY(DIMENSION = 8)             LDMODE
     10                                 DEF       LDMODE                                   LDMODE
     11                                 REF       D                                        LDMODE
     12                                 REF       15TBUFF                                  LDMODE
     13          00000000      R0      EQU       0                                        LDMODE
     14          00000001      R1      EQU       1                                        LDMODE
     15          00000002      R2      EQU       2                                        LDMODE
     16          00000003      R3      EQU       3                                        LDMODE
     17          00000004      R4      EQU       4                                        LDMODE
     18          00000005      R5      EQU       5                                        LDMODE
     19          00000006      R6      EQU       6                                        LDMODE
     20          00000007      R7      EQU       7                                        LDMODE
     21          00000008      R8      EQU       8                                        LDMODE
     22          00000009      R9      EQU       9                                        LDMODE
     23          0000000A      R10     EQU       10                                       LDMODE
     24          0000000B      R11     EQU       11                                       LDMODE
     25          0000000C      R12     EQU       12                                       LDMODE
     26          0000000D      R13     EQU       13                                       LDMODE
     27          0000000E      R14     EQU       14                                       LDMODE
     28          0000000F      R15     EQU       15                                       LDMODE
     29    01 00000            LDMODE  RES       0          = ENTERANCE                   LDMODE
     30    01 00000  02200000 A        LCI       0                                        LDMODE
     31    01 00001  23000023          STM,R0    REGSAV     = SAVE ALL REGISTERS          LDMODE
     32    01 00002  4610000F A        XW,R1     R15                                      LDMODE
     33    01 00003  32220000 A        LW,R2     0,R1       = ADDRESS OF I                LDMODE
     34    01 00004  48200033          AND,R2    =X'FFFFFF' = MASK OUT OP CODE            LDMODE
     35    01 00005  32220001 A        LW,R3     1,R1       = ADDRESS OF J                LDMODE
     36    01 00006  48300033          AND,R3    =X'FFFFFF' = MASK OUT OP CODE            LDMODE
     37    01 00007  32440000 A        LW,R4     0,R2       = I = LINK NUMBER             LDMODE
     38    01 00008  204FFFFF A        AI,R4     -1                                       LDMODE
     39    01 00009  25400003 A        SLS,R4    3          = INDEX = (I-1)*8             LDMODE
     40    01 0000A  20400009 A        AI,R4     9                                        LDMODE
     41    01 0000B  52A80000 X        LH,R10    15TBUFF,R4 = VOLUME                      LDMODE
     42    01 0000C  35A60001 A        STW,R10   1,R3                                     LDMODE
     43    01 0000D  20400001 A        AI,R4     1                                        LDMODE
     44    01 0000E  52A80000 X        LH,R10    15TBUFF,R4 = OCCUPANCY                   LDMODE
     45    01 0000F  35A60003 A        STW,R10   3,R3                                     LDMODE
     46    01 00010  20400001 A        AI,R4     1                                        LDMODE
     47    01 00011  52A80000 X        LH,R10    15TBUFF,R4 = QUEUES                      LDMODE
     48    01 00012  35A60002 A        STW,R10   2,R3                                     LDMODE
     49    01 00013  20400001 A        AI,R4     1                                        LDMODE
     50    01 00014  52A80000 X        LH,R10    15TBUFF,R4 = STAPS                       LDMODE
```

FIGURE 4.6.1. FORTRAN CALLABLE SUBROUTINE (Continued)

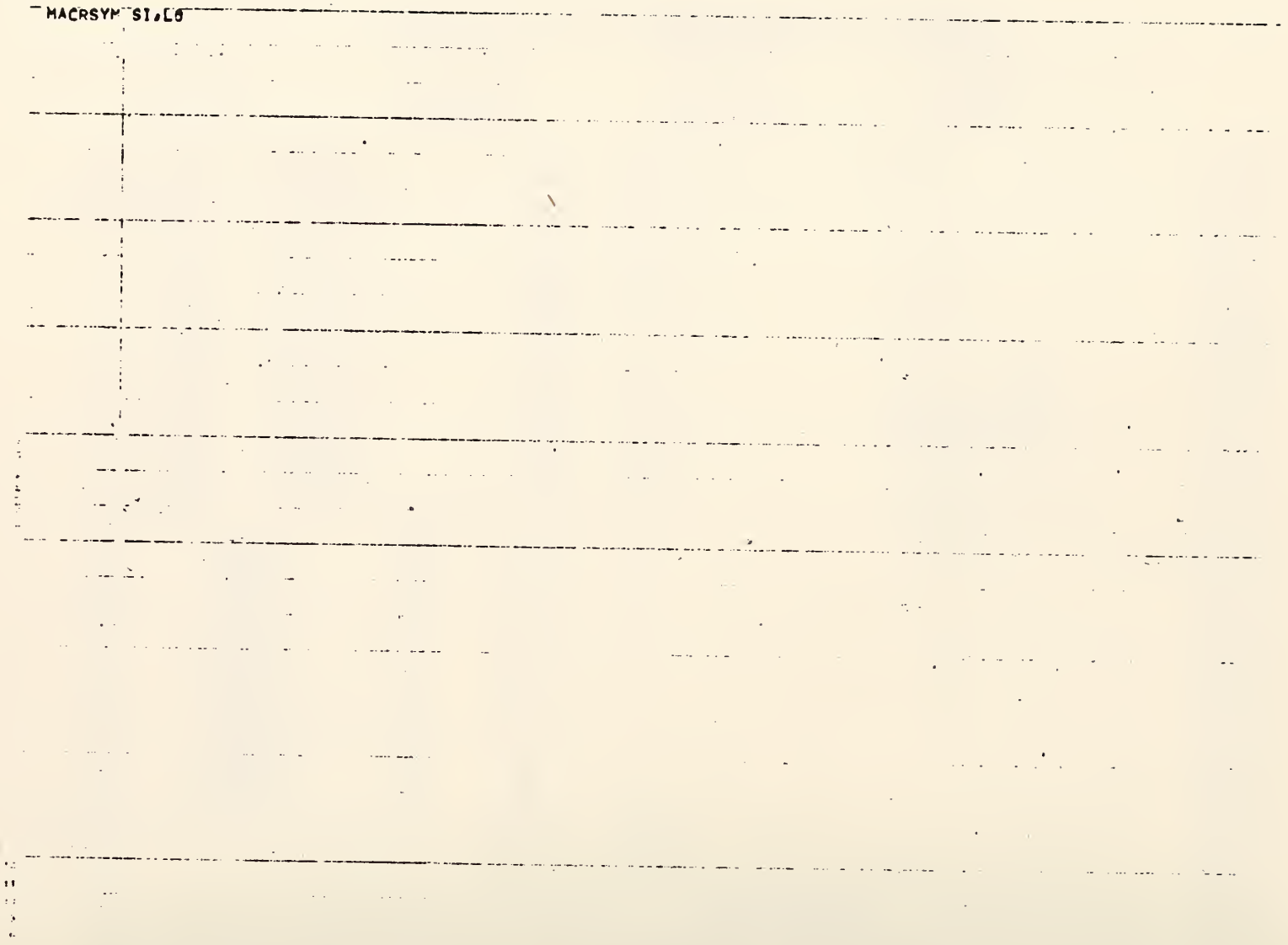
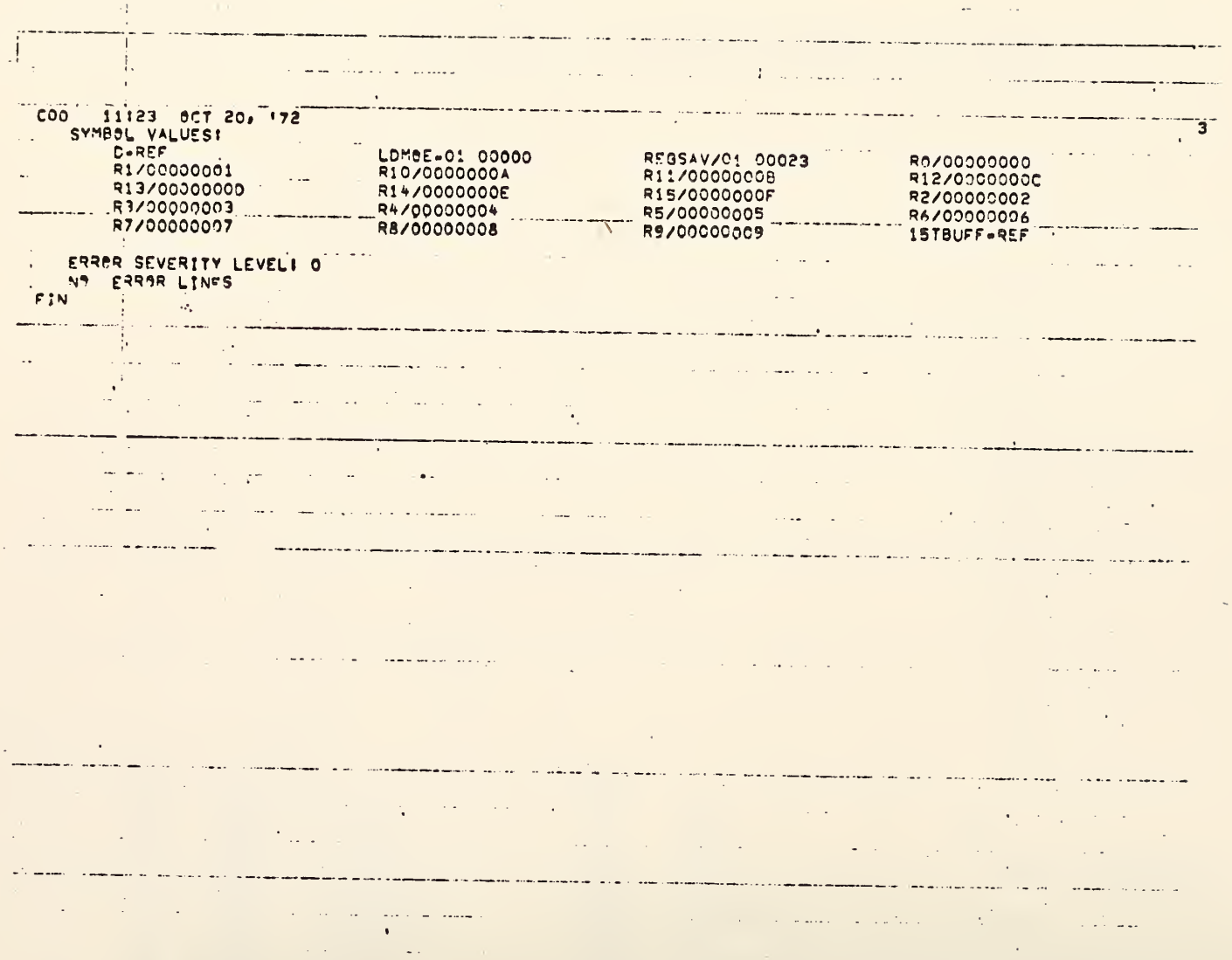


FIGURE 4.6.1. FORTRAN CALLABLE SUBROUTINE (Continued)

```
C00   11:23  OCT 20, '72                                                                    2
      51   01 00015   35A60004 A          STW,R10   4,R3                                   LDM0E
      52   01 00016   20400001 A          AI,R4     1                                     LDM0E
      53   01 00017   52A80000 X          LH,R10    15TBUFF,R4      * AVERAGE SPEED       LDM0E
      54   01 00018   35A60006 A          STW,R10   6,R3                                  LDM0E
      55   01 00019   20400001 A          AI,R4     1                                     LDM0E
      56   01 0001A   52A80000 X          LH,R10    15TBUFF,R4      * TRAVEL TIME         LDM0E
      57   01 0001B   35A60005 A          STW,R10   5,R3                                  LDM0E
      58   01 0001C   20400001 A          AI,R4     1                                     LDM0E
      59   01 0001D   52A80000 X          LH,R10    15TBUFF,R4      * DELAY               LDM0E
      60   01 0001E   35A60007 A          STW,R10   7,R3                                  LDM0E
      61   01 0001F   07300000 A          LCI       0                                     LDM0E
      62   01 00020   2A000023            LM,R0     REGSAV          * RESTORE ALL REGISTERS LDM0E
      63   01 00021   30F0000E A          AW,R15    R14                                   LDM0E
      64   01 00022   E800000F A          B         *R15            * EXIT                LDM0E
      65   01 00023              REGSAV    RES       16                                    LDM0E
      66                                   END
           01 00023   000FFFFF A
```

FIGURE 4.6.1. FORTRAN CALLABLE SUBROUTINE (Continued)



```
COO   11123  OCT 20, '72                                                    3
   SYMBOL VALUES:
      D-REF                LDMBE-01 00000       REGSAV/01 00023      R0/00000000
      R1/00000001          R10/0000000A         R11/0000000B         R12/0000000C
      R13/0000000D         R14/0000000E         R15/0000000F         R2/00000002
      R3/00000003          R4/00000004          R5/00000005          R6/00000006
      R7/00000007          R8/00000008          R9/00000009          ISTBUFF-REF

   ERROR SEVERITY LEVEL: 0
   NO  ERROR LINES
FIN
```

FIGURE 4.5.1 FORTRAN PROGRAM (Continued)

4.7 UTCS Traffic Algorithms

4.7.1 Algorithms Included

Algorithms used in the UTCS program for the following quantities are described:

- Volume
- Occupancy
- Speed
- Queue
- Stops
- Delay
- MOE Periods
- Critical Intersection Control

4.7.2 Smoothed Quantities

Whenever smoothed MOE values are required, the following equation is applied:

$$Qu(I) = Qu(I-1) + K * [QM - Qu(I-1)] \qquad (4.7.2.1)$$

where

Qu(I) = Ith value of the quantity.

QM = Measured value of the quantity.

K = Smoothing filter constant (varies from 0 to 1).

4.7.3 Volume

The volume, V, in vehicles per hour (vph) on each link is determined by:

$$V = \frac{1}{jT} \sum_{k=1}^{j} n(k) \qquad (4.7.3.1)$$

where

j = Number of detectors in link

n(k) = Number of vehicles counted by detector, k, over time, T (in hours).

The volume, VO (= number of cars leaving the link during link green), is given by:

$$VO = ZDO + CC1 \qquad (4.7.3.2)$$

where ZDO = Number of cars between stop bar and first (furthest downstream) detector at end of green.

CCI = Number of cars crossing first (furthest downstream) detector during green.

Note that the determination of ZDO is discussed later under "Stops and Queue". Also the value of VO used in the CIC routine is the smoothed value.

4.7.4 Occupancy

The percent occupancy, Occ, is derived as follows:

$$Occ = \frac{100}{jT_s LL} \sum_{k=1}^{1} \sum_{i=1}^{n(k)} (TT(i, k) - TD) \qquad (4.7.4.1)$$

where

j = Number of detectors on link.

T_s = Total time in seconds over which summation takes place.

LL = The ratio of the effective length as measured by the detector presence pulse to the (emperically derived) physical length of the vehicle

$$\approx \frac{E_{VEH} + E_{LOOP} + E_{GEOM}}{LBAR}$$

LBAR = Average physical vehicle length

E_{VEH} = Average effective vehicle length

E_{LOOP} = Average effective loop length

E_{GEOM} = Average reduction in effective loop length due to loop geometry

TT (i,k) = Measured presence time in seconds of ith vehicle over detector, k.

TD = Detector bias (drop-in plus fall out time) in seconds.

n(k) = Number of vehicles counted by detector, k.

4.7.5 Speed

The equation for determining the average speed, S, in miles per hour is (assuming that each vehicle has a length of LBAR feet):

$$S = \frac{KV1*LL}{\sum_{k=1}^{j} n(k)} \sum_{k=1}^{j} \sum_{i=1}^{n(k)} \frac{1}{(TT(i,k) - TD)} \qquad (4.7.5.1)$$

where

KV1 = Constant for converting sec^{-1} to miles per hour. (This constant contains LBAR).

LL = Correction factor for finite loop length.

n(k) = Number of cars counted by detector, k.

j = Number of detectors on link.

TT(i,k) = Measured presence time in seconds of ith vehicle over detector k.

TD = Detector bias in seconds.

4.7.6 Queues and Stops

The determination of queues and stops depends on the continuous measurement of the number of cars in each zone in a multidetector link, where:

Zone 0 is the portion of the link between the furthest downstream detector (detector 1) and the stop bar,

Zone 1 is the portion of the link between detector 1 and detector 2 (the next upstream detector), and

Zone 2 is the portion between detectors 2 and 3, if there is a third detector.

Whenever the traffic is flowing freely, the zone counts are maintained by a simple in and out count of the vehicles with the restrictions that the number in each zone can never fall below zero and can never exceed the capacity of the zone.

Whenever a car entering a zone expects to stop in a zone, its speed over the upstream detector will depend on where the driver expects to stop, i.e. the distance expressed in car lengths. Thus, the duration of the presence signal over the detector can be related to the number of cars the driver sees within the zone he is entering:

$$Q = QCAP - D(TTC) \qquad (4.7.6.1)$$

where

Q = Number of cars in zone observed by driver, which are expected to stop in the zone.

QCAP = Capacity of zone in terms of car lengths.

D(TTC) = Expected stopping distance in car lengths as a function of corrected detector pulse width, TCC
(= TT - TD, where TT = observed pulse width and
TD = detector bias).

Defining N2 = Q1 - QCAP

where Q1 = Capacity of Zone 1, car lengths, the equation can be rewritten as

$$Q = Q1 - D(TTC) - N2$$
$$= QM(TTC) - N2 \qquad (4.7.6.2)$$

where QM(TTC)= Q1 - D(TTC)

The function QM(TTC) is obtained by actual observations. Figures 4.7.6.1, 4.7.6.2 and 4.7.6.3 were plotted on the basis of aerial photographs of traffic flow in the UTCS area. The three different plots are due to three different free flow speeds which in turn can be related to the lengths of a link.

Any car in Zone 2 which can still find room in Zone 1 will not stop in Zone 2. The number of such cars, TP, is given by

$$TP = Q1 - ZD1 \qquad (4.7.6.3)$$

where ZD1 = Cars in Zone 1.

Thus the cars, DM, observed in Zone 2 is

$$DM = QM + TP.$$

In the case of Zone 1, DM = QM.

Since DM can only be regarded as an estimated number, the actual car count, ZD, in a zone is taken to be

$$ZD(I+1) = ZD(I) + KN * \left[DM - ZD(I) \right] + 1 \qquad (4.7.6.4)$$

where

KN = Zone count smoothing filter constant.

The factor 1 is due to the fact that the car crossing the upstream detector must be added to the number of cars in the zone.

The slowing down algorithm is not used in Zone 2 until the total zone count exceeds the capacity of Zone 0 plus Zone 1 since up to that time none of the cars will have to stop

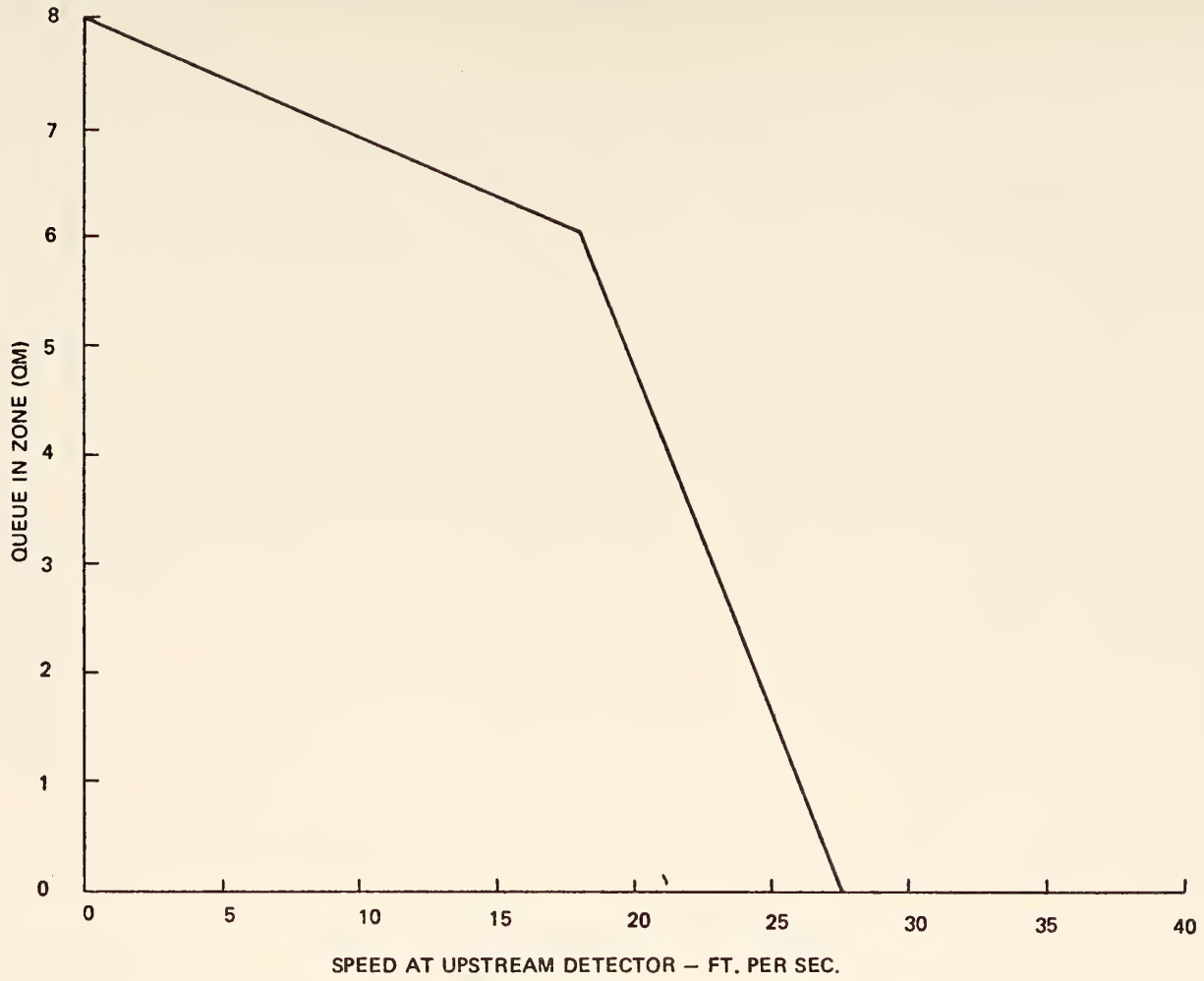


Figure 4.7.6.1. Observed Queue vs. Speed Over Detector - Block <400 ft. Long

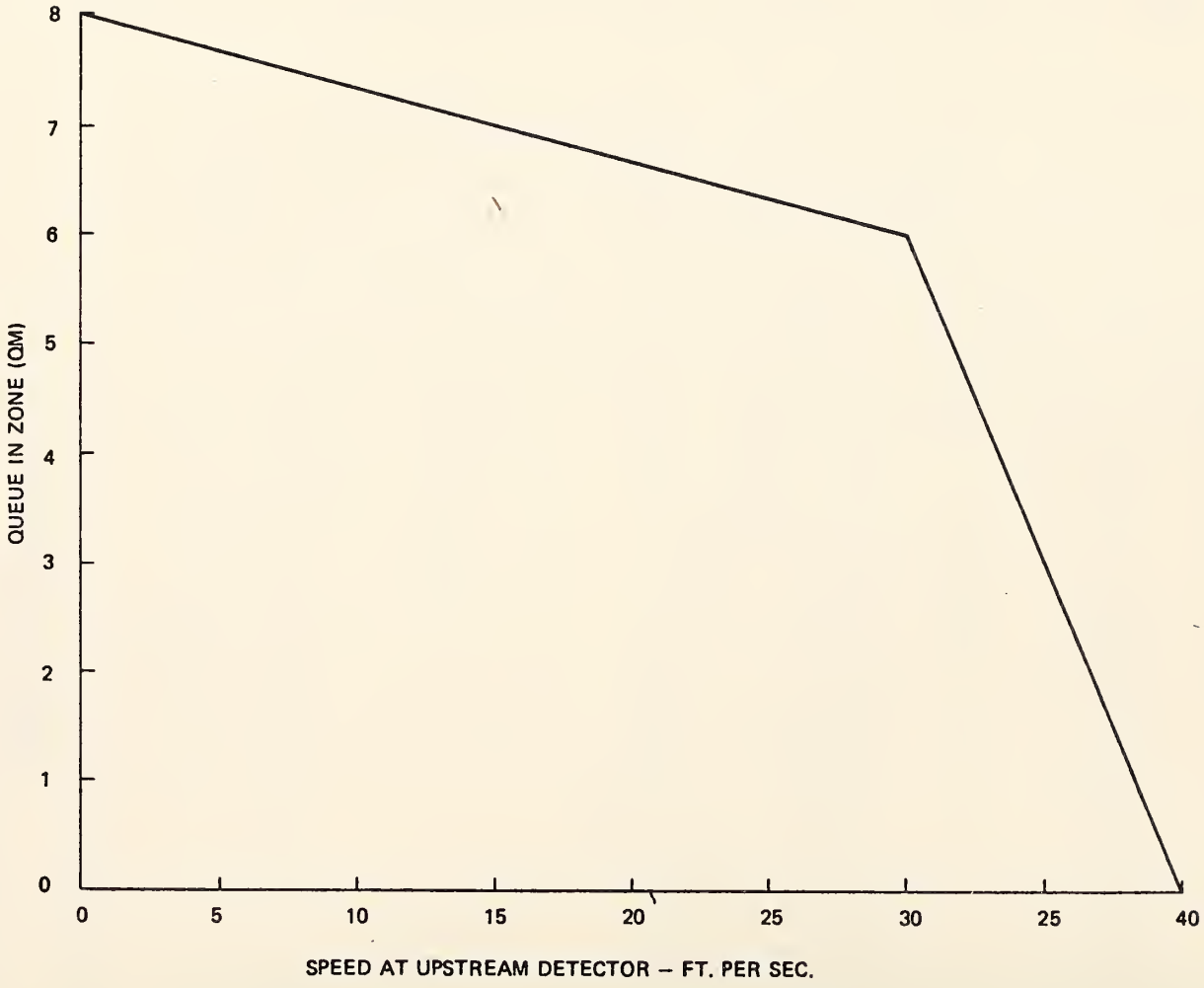


Figure 4.7.6.2. Observed Queue vs. Speed Over Detector - Block > 500 ft. Long

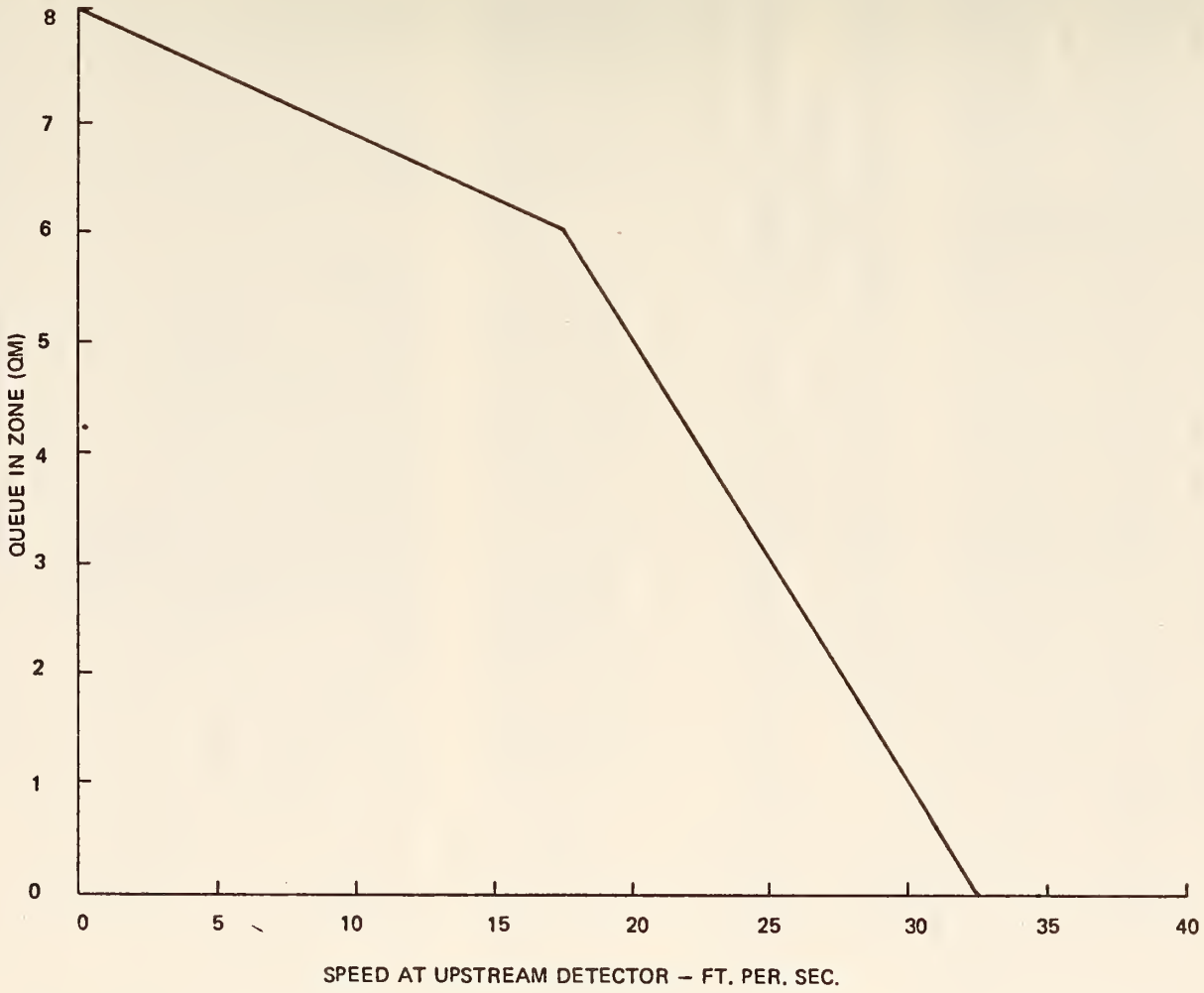


Figure 4.7.6.3.. Observed Queue vs. Speed Over Detector - Block 400-500 ft. Long

in Zone 2. This also ensures that TP cannot be negative during the formation of a queue in Zone 2.

Whenever a queue is still forming in a zone after the light turns green for the link, the car count in the zone is equal to the queue length in cars minus the number of cars leaving the zone during green. This last number equals CC1 for Zone 1 while for Zone 2 it is given by the capacity of Zone 1 minus the sum of CC1 and the Zone 1 count.

Whenever a car leaves a zone the corresponding zone count is reduced by one.

Since Zone 0 has no downstream detector, there can be no direct count of the cars leaving the zone. Its capacity is only one car; thus the above described slowing down estimation is inapplicable. In order to correct the count in this zone to the greatest extent possible, the following procedure is used:

a) At the start of red for a link the zone count in Zone 0 is taken to be 1, if the Zone 1 count exceeds 3 cars. It is taken as 0 if the Zone 1 count is 3 or less.

b) Whenever the Zone 1 count exceeds 3 during the red period, the Zone 0 count is set equal to 1.

4.7.6.1 Queues

Whenever the term "queue" is used without a modifier, the sum of the zone counts within a link at the instant the traffic signal turns green for the phase is implied. Another queue, QCIC, is used for CIC control which is an estimate of the number of cars in the actual stopped queue at green.

If there are no indications of the zones being completely filled, QCIC is simply given by the Zone 0 plus Zone 1 counts. If the smoothed pulse widths at the upstream detector of Zone 1 are so large that Zone 1 is apparently filled, QCIC is equal to the Zone 0 plus Zone 1 counts plus a number representing an estimate of the queue extension beyond the second detector. If both Zones 1 and 2 are apparently filled, QCIC is given by the Zone 0 plus Zone 1 counts plus the capacity of Zone 2 plus a number representing the estimated queue extension beyond the third detector.

4.7.6.2 Stops

The computation of stops requires a knowledge of the zone counts and an exact determination of phase relationships at all times. It is assumed that no vehicle will exceed the free flow speed for the link in question and that all vehicles will follow a predetermined trajectory based on the number of vehicles already in the zone. The latter assumption is also basic to the entire queue algorithm as discussed previously.

Figure 4.7.6.4 illustrates the time-space relationships used in the stops algorithm. In this figure t_r is the time when the light actually changes to red for the link while t_g is the actual time the light changes to green. It can be seen that any car arriving at the second detector before time t_1 will be able to clear the intersection while after t_1 it will have to stop. Thus t_1 is considered to be the "predicted red time".

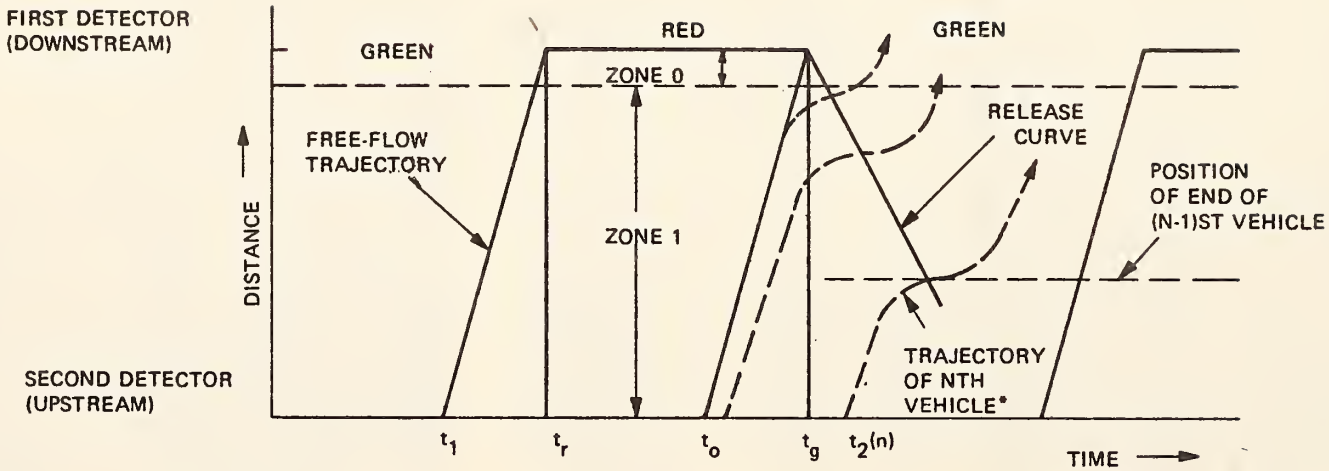
Similarly if there are no cars in Zone 0 or Zone 1, a car crossing the second detector after time t_o will not have to make a full stop although it may slow down as shown in the uppermost trajectory. Thus, time t_o is considered to be the "predicted green time".

All cars crossing the second detector between times t_1 and t_o will have to stop. If there are cars in Zone 0 and Zone 1 at time t_2, cars crossing the second detector after time t_o will also have to stop. This necessitates defining a time, t_2, known as the "stops threshold time". Cars crossing the detector before time, t_2, will have to stop while those crossing after may slow down, but will not have to stop.

This time, t_2, is a function of the number of cars in Zones 0 and 1. Thus, in Figure 4.7.6.4 if there are N-1 vehicles in the queue at time t_g, the (N-1)st vehicle will start moving at the time indicated by the intersection of the "Release Curve" and the "Position of End of (N-1)st Vehicle". If a vehicle crosses the second detector at time $t_2(n)$, it will not have to make a full stop and the same holds true for any vehicle crossing after this time. Thus, this time represents the desired "stops threshold time". However, if the nth vehicle crossed before time $t_2(n)$, it would join the queue and the stops threshold time would be increased.

It can be seen that the stops threshold time, for any number of stopped vehicles, can be obtained by projecting the intersection of the release curve and the end of the stopped queue back to the position of the second detector in the time-space diagram, by means of the trajectory labeled "trajectory of nth vehicle". A table has been prepared giving the time t_2 as a function of the distance of the end of the stopped queue in terms of vehicle lengths. The time t_2 in the table is measured from t_o. This table has been extended to be applicable to three detector links by enlarging the time-space diagram to include Zone 2 with the third detector placed eight car lengths from the second detector. In this case, t_2 is still given in terms of the time from t_o, where t_o is still the predicted green time at the second detector. This table is called DT in the program.

For a two detector link the number of stops for each cycle is determined as described in the following sentences. At the predicted green time, t_o, the sum of the Zone 0 and Zone 1 counts is obtained. This number is used to enter a table giving the stops



*VEHICLE THAT JOINS THE QUEUE JUST AS THE LAST OF THE STOPPED VEHICLES STARTS TO MOVE.

Figure 4.7.6.4. Time-Space Diagram for Stops Computation

threshold time for this length of stopped queue. This time is loaded into a STOP1 clock which is counted down each second. If a car crosses the second detector before the STOP1 clock is counted down to zero and before time t_g, the sum of the zone counts is again used to obtain a new stops threshold time. The difference between this new time and the old time is algebraically added to the STOP1 clock. If the car enters after the green time t_g, the number used for entering the table is given by the sum of the zone counts plus the count of the vehicles leaving the link, CC1. CC1 is given by the number of cars crossing the first detector after the green time t_g. The number thus defined represents the total length of the end of the stopped queue before the last car is released from the link.

The stops threshold time is given when the stops clock STOP1 is counted down to zero. The number of stops for the cycle is then given by the total of the Zone 0 and Zone 1 counts plus CC1.

For a three detector link the above algorithm is used as long as the total count in all three zones does not exceed the capacity of Zone 0 plus Zone 1. When the number exceeds this capacity a stops clock, STOP2, is used which is loaded by a number obtained from the same table used for a two detector link. This table is extended to include a queue equal to the capacity of Zone 0 plus twice the capacity of Zone 1.

Since the capacity of Zone 2 is variable and never greater than the capacity of Zone 1, a correction must be made for this factor. The times used for loading and updating the STOP2 clock are found by entering the table with a queue equal to the total car count plus CC1 plus N2, and subtracting from the time thus obtained the extra time required to disperse a queue of N2 vehicles. This dispersed time is found to simply equal N2 seconds since the queue dispersal rate; i.e. the slope of the "release curve", has been found to be very nearly equal to 1 second per vehicle.

Once stops clock, STOP2, is set, the number of stops for a cycle is obtained when STOP2 is counted down to zero. The stops are then set equal to the Zero 0 plus Zone 1 plus Zone 2 counts plus CC1.

If the intersection is a bus priority intersection, it is necessary to take into account the possibility that the red time for a link on this intersection may be extended. Since a bus extension is automatically inhibited whenever the STOP2 clock is loaded; i.e. when the total zone count exceeds the capacity of Zone 0 plus Zone 1, the correction need only be applied to the STOP1 clock.

If a bus extension is granted before the STOP1 clock goes to zero, the time in the STOP1 clock is increased by the amount of the bus extension. If the STOP1 clock goes to zero before green is displayed for the link (and STOP2 has not been loaded), the total zone count is stored at that time. Whenever a car crosses the second detector, an update for the STOP1, BTDIFF, is calculated and stored. If no bus extension is granted before green is displayed, at green the number of stops for the cycle is set equal to the stored zone count.

If a bus extension is granted before green, the STOP1 clock is loaded with the sum of the bus extension plus BTDIFF and the number of stops for the cycle will be equal to the total zone count when the STOP1 clock is counted down to zero.

4.7.7 Delay

The derivation of the algorithm used to obtain delay in UTCS is obtained with the aid of Figure 4.7.7.1. Although only two detectors are shown the relationships will also hold for three detector links simply by inserting the position of the 3rd detector instead of the second detector. One basic simplifying assumption used in this derivation is that the vehicles arriving during the red phase are uniformly spaced. The definitions of the quantities shown in Figure 4.7.7.1 are as follows:

QR = Total zone count at beginning of red phase.

QG = Total zone count at beginning of green phase; i.e. "queue".

RR = Queue release date across intersection during green phase in seconds per vehicle.

DR = Duration of red phase in seconds.

TR = Time of beginning of red phase.

TG = Time of beginning of green phase.

As long as the queue formation rate is approximately equal to the queue dispersal rate the delay for each vehicle forming QR will be closely equal to the red time, DR. Thus, the total delay of these vehicles is QR * DR.

The number of vehicles entering the zones during the red phase is QG - QR. The delay for each vehicle, by definition, is the time that each vehicle stays in the link less the time needed to traverse the link at the free flow speed, FFS. The total time after green taken for the last vehicle to leave the link is QG * RR seconds. The first vehicle which arrives during red leaves the link (QR+1) * RR seconds after green. Thus the average time

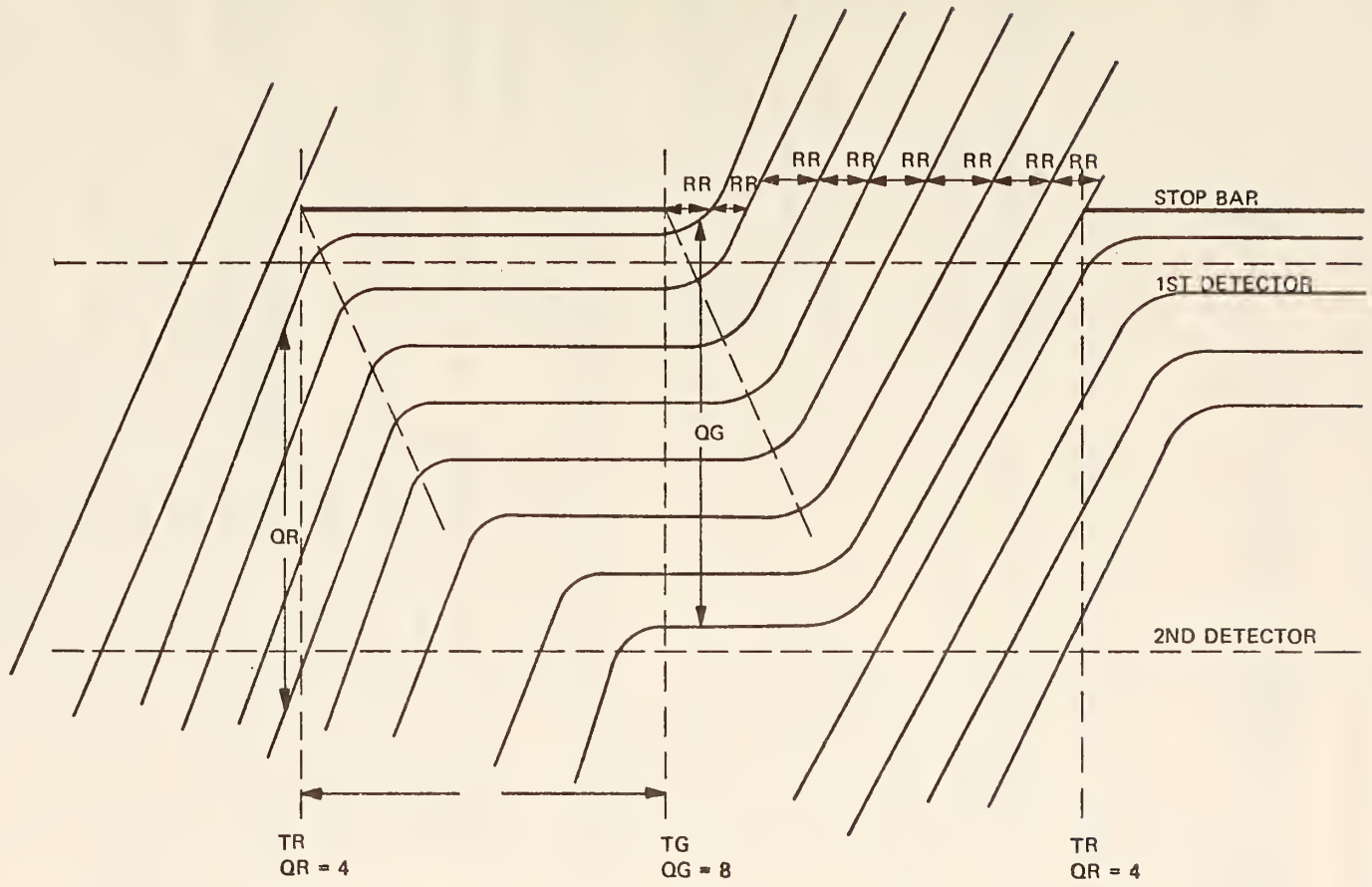


Figure 4.7.7.1. Time-Space Diagram for Two Detector Link

each of these vehicles leaves is (QG + QR + 1) * RR/2 seconds after green. Similarly the average arrival time for these vehicles is DR/2 seconds before green. The free flow traversal time is D/FFS where D is the length of the link (actually the total distance from the stop bar to the 2nd or 3rd detector). Thus the total delay for all vehicles is

$$\text{Delay} = QR * DR + \frac{(QG-QR)}{2} * \left[(QG+QR+1) * RR + DR - \frac{2D}{FFS} \right] \qquad (4.7.7.1)$$

which can be rearranged as

$$\text{Delay} = \frac{(QG+QR)}{2} * [DR + (QG-QR) * RR] - (QG-QR) * \frac{D}{FFS} \qquad (4.7.7.2)$$

where the term $(QG-QR) * \frac{RR}{2}$ has been dropped since it is negligible with respect to the remaining terms. A negative value of the delay is excluded by the program.

4.7.8 Calculation of MOE Periods

The MOE periods are times which are loaded into MOE clocks in order to determine the exact moment of an "action time". An action time is defined as the time during a controller cycle at which one critical or MOE link has its signal go from red to green and/or a critical link goes from green to red. Thus whenever an MOE clock is counted down to zero, an action time takes place.

In addition to actual action times which are counted down in MOE1 clocks, there are "predicted" action times. These times occur nine seconds before the actual action times. The nine second period is the time required for a vehicle moving at mean free flow speed to traverse the distance from the position of the second detector or a multidetector link to the stop bar. Thus such a vehicle crossing the second detector at a "predicted" action time would reach the intersection just when the traffic signal will change. These predicted times are timed out by the MOE2 clocks.

The calculation of the MOE periods can best be described with the aid of Figure 4.7.8.1. The first adjustable MOE1 period encompasses controller intervals 1, 2 and 3 and is set equal to their sum while the first adjustable MOE2 period is set equal to this sum minus nine seconds. The second adjustable MOE1 period equals the sum of intervals 4, 5 and 6 while the MOE2 period is nine seconds less. The third adjustable MOE2 period is made equal to 9 seconds less than the sum of intervals 7, 8 and 9.

There is no third adjustable MOE1 period. The corresponding fixed MOE1 period is given a nominal large value (255 seconds) which can never be counted down to

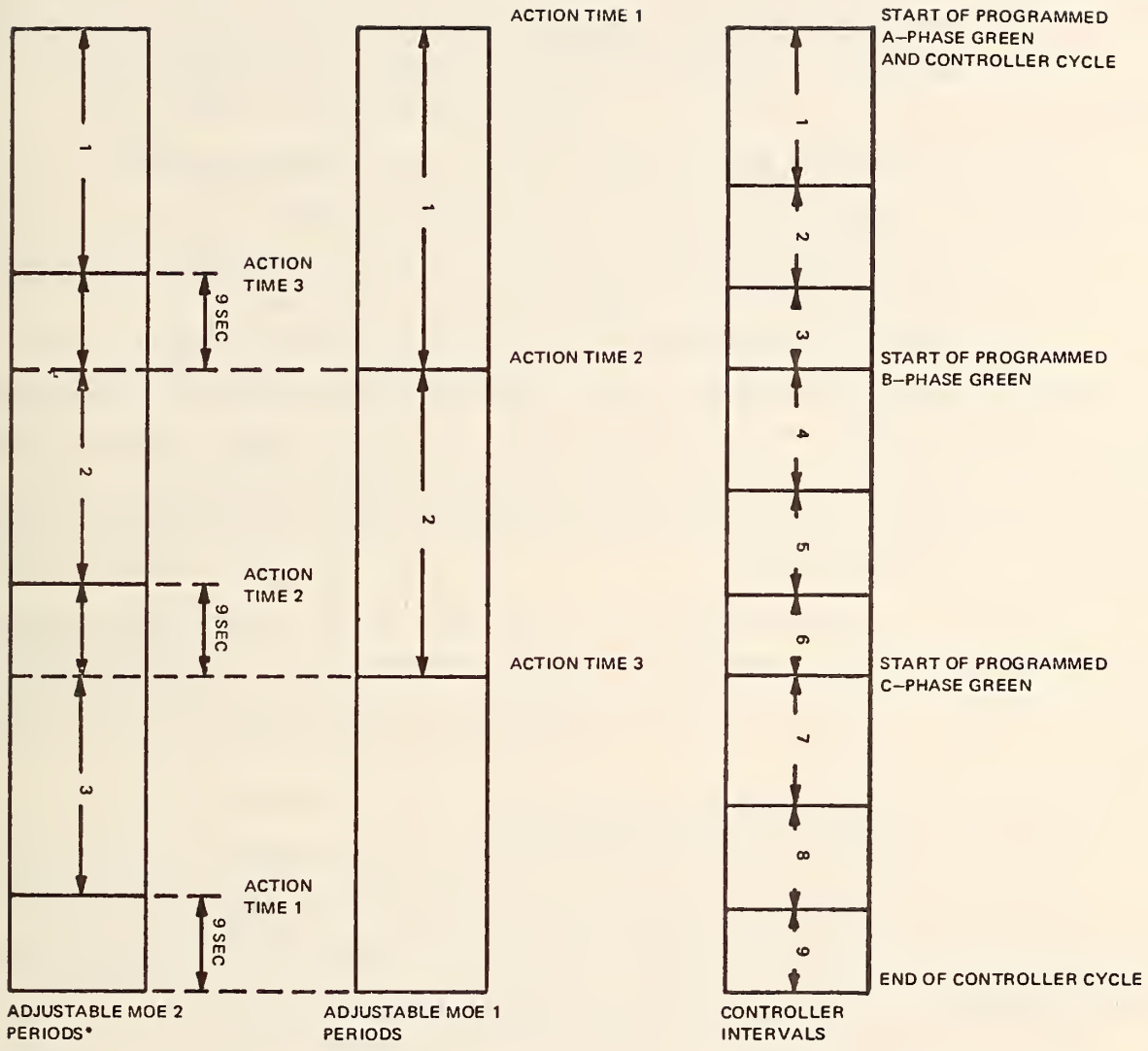

ACTION TIME 1
ACTION TIME 3
9 SEC
ACTION TIME 2
ACTION TIME 2
9 SEC
ACTION TIME 3
ACTION TIME 1
9 SEC
ADJUSTABLE MOE 2 PERIODS*
ADJUSTABLE MOE 1 PERIODS
START OF PROGRAMMED A–PHASE GREEN AND CONTROLLER CYCLE
START OF PROGRAMMED B–PHASE GREEN
START OF PROGRAMMED C–PHASE GREEN
END OF CONTROLLER CYCLE
CONTROLLER INTERVALS
*THERE IS ONE MORE ADJUSTABLE MOE 2 PERIOD THAN MOE 1 PERIODS.

FIGURE 4.7.8.1. MOE TIMING DEFINITIONS

zero. This is done to avoid synchronization problems. The end of a cycle for each controller is always determined by the "countdown clock" which counts down each controller cycle at which time the first MOE periods are loaded into the MOE clocks.

In addition to the adjustable MOE periods there will always be several fixed periods which will have values of either 0 or 255 seconds. These fixed MOE periods which may lie before, between or after the adjustable periods are required due to the following reasons:

1. The final MOE1 or MOE2 period must never be counted down to zero. Thus as discussed above, these periods will be given values of 255 seconds.

2. If more than one link has the same traffic signal change at an action time, a zero length MOE period is required to indicate the second link's change.

3. Since usually there is an action time at the start of a cycle, there will have to be one or more MOE1 periods of zero length at the start of each cycle.

4. The format of the MOE tables giving green link numbers, red link numbers, etc., at the end of each MOE period require that the number of MOE1 periods and MOE2 periods for each controller be equal. Thus there will be one or more zero length MOE2 periods not corresponding to any actual action time at the start of each MOE2 period list for each controller while each MOE1 period list will contain an extra 255 second period at the end corresponding to the last MOE2 period.

It must also be mentioned that the first adjustable MOE2 period could be negative, if nine seconds are deducted from the first adjustable MOE1 period. In this case the MOE2 period is set equal to zero while the second MOE2 period is reduced by the calculated negative value for the first period.

4.7.9 Critical Intersection Control (CIC) Algorithm

The CIC controllers have their splits adjusted according to the following algorithm:

1. The green demand time is computed for each selected critical link feeding the critical intersection as a function of both the volume of vehicles leaving the link during link green and the stopped queue which exists at the beginning of green.

The green demand time, GD, is obtained by the following equation:

$$GD = RR * (VO + \Delta Q) \qquad (4.7.9.1)$$

where RR = the average time it takes each vehicle to clear the intersection, seconds

VO = the measured number of vehicles clearing the intersection during green

ΔQ = the increase in stopped queue at the start of green during a cycle.

2. If a controller phase has only one critical link assigned to it, the green demand time for the phase will be set equal to the green demand time for that link. If the phase has

more than one critical link assigned to it, the green demand time for the phase will be set equal to the larger of the two link demand times.

Thus:

$$GD_p = \text{Max} \left\{ GD_{p1}, GD_{p2} \right\} \quad (4.7.9.4)$$

where GD_{p1} = green demand time for the first critical links in phase P

GD_{p2} = green demand time for the second critical link in phase P

GD_p = green demand time for phase P

3. The green demand time on at least one of the critical links feeding the intersection must exceed an upper threshold in order to initiate critical intersection control. This step will maintain the controller under area control unless one or more links is approaching saturation. In order to retain the controller under critical intersection control, the green demand time on at least one of the critical links must exceed a lower threshold. The use of these two thresholds provides a hysteresis correction in order to prevent switching back and forth between area control and critical intersection control.

4. The ratio of the actual green time on any phase to the total green time available for all critical phases will be set equal to the ratio of green demand time on that phase to the total green demand time.

$$\frac{G_p}{G_T} = \frac{GD_p}{\Sigma GD_I} \quad (4.7.9.5)$$

where G_p = Calculated green time for phase P

G_T = Total available green time for all critical phases

ΣGD_I = Sum of calculated green demand times for all critical phases.

5. The actual green times for all critical phases must not decrease below the prescribed minimum values in effect for the current pattern. If any calculated values fall below this minimum, the actual green time for this phase, G_1, will be set equal to this minimum, $(G_1)\text{min}$. In the case of a two phase controller the actual green time for the phase, G_2, will be set equal to:

$$G_2 = G_T - (G_1)\text{min} \quad (4.7.9.6)$$

In the case of a three phase controller we set

$$G_T^1 = G_T - (G_1)\text{min} \quad (4.7.9.7)$$

and

$$G_p = \frac{GD_p}{\Sigma G_I} * G_T^1 \qquad (4.7.9.8)$$

where G_p and GD_p now only refer to the remaining two phases and ΣG_I is only summed over these phases.

If now either of the two calculated green times is less than its prescribed minimum, the actual green time for this phase is set equal to the minimum while the actual green time for the remaining phase is set equal to the difference between G_T^1 and this minimum.

If all cars clear during green the stopped queue at the start of green will remain more or less constant. However, if they do not all clear, the queue will increase steadily. Thus, whenever the measured stopped queue, QCIC, increases beyond the expected queue, QK, this is an indication that all cars are not clearing. Thus, the excess queue, ΔQ, is given by

$$\Delta Q = QCIC - QK \qquad (4.7.9.2)$$

whenever $QCIC > QK$. (4.7.9.3)

Thus, the total green demand time required to clear all vehicles represents the time needed for the vehicles actually clearing plus those in the excess queue to clear the intersection as given in equation (4.7.9.1).

4.8 Bus Intersection Gain Algorithm

The intersection gain algorithm computes the value of an extension by summing five gain and delay factors as follows:

- Car gain - passenger minutes saved due to favored car thruput during the extension period
- Bus Gain passenger minutes saved due to favored bus thruput during the extension period
- Queue Delay - passenger minutes lost due to delay of queued cross street traffic by the extension period
- Truncated Car Delay - passenger minutes lost due to the inability of some queued cross street cars to clear the intersection because of the extension
- Truncated Bus Delay - as above, but for cross street buses.

Each of the gain factors is computed for every GRED link for the current MOE1 period at the intersection; each of the delay factors for every GGRN link. Links not classified as GRED or GGRN are not considered in the computations. (The latter case arises in circumstances where traffic flow continues through an intersection in one direction after flow in the opposing direction stops.) A GRED link is one which currently has a green signal, but will have a red signal in the next MOE1 period, while a GGRN link is one with a current red signal, but which will have a green signal in the next MOE1 period.

Upon entry into the intersection gain algorithm a look up is made of the lane count (LC) and bus load (BL) for each GRED link. (Bus load will vary as a function of time of day.) The extension granted clock (EGC) is checked next to determine whether a first or second pass through the algorithm is being made. A non-zero value for EGC indicates a second pass and required the use of helped bus counts (HSBC, HTBC) rather than eligible bus counts (ESBC, ETBC) in the algorithm. For either the first or second pass the car gain (CG) and bus gain (BG) are set to zero and these factors are then computed anew for each GRED link. The mathematical expressions to be used are:

$$CG = (FR - \frac{E}{2}) \ (\frac{E}{2.1}) \ (1.5 \ LC)$$

$$BG = (FR - \frac{E}{2}) \ (ESBC + ETBC) \ (BL)$$

where

$(FR - \frac{TEW}{2})$ = average minutes saved; favored street red interval less half the extension period

$\frac{TEW}{2.1}$ = car thruput per lane for extension period

1.5 LC = scaling factor; 1.5 passengers per car times the lane count

(ESBC + ETBC) = number of eligible stop and thru buses

BL = bus passenger load

The algorithm then moves on to compute the delay factors on the GGRN lines. Here, no separate path is necessary for the first and second passes. For each GGRN link the queue and queue delay are first calculated as follows:

$$Q = ZD0 + ZD1$$

$$QD = TEW \left[Q * 1.5\ LC + ZC\ (BL) \right]$$

where

Q = queue on link

ZD0 = car count in zone zero

ZD1 = car count in zone one

QD = queue delay in passenger minutes

TEW = extension interval

1.5 LC = scaling factor defined earlies

ZC = bus count in bus zone

BL = bus passenger load

Next, the number of cross street cars prevented from clearing the intersection on the following cross street green is computed. This is simply the difference between the number of cars clearing during normal cross street green and those clearing during the shortened green following an extension on the favored street, mathematically, this is given by:

$$TC = NGC - SGC$$

$$NGC = 5 + \frac{G - 14.2}{2.1}; \text{ (or Q, if smaller)}$$

$$SGC = NGC - \frac{TEW}{2.1}; \text{ (or Q, if smaller)}$$

where:

TC = cars truncated per lane

NGC = cars clearing on normal green per lane

SGC = cars clearing on shortened green per lane

G = normal cross street green interval

TEW = extension interval

Q = queue per lane

The smaller value of NGC or Q (and SGC or Q) is used as indicated above and on the logic flow diagram. Thus, where the queue is less than both NGC and SGC, no truncation will occur.

For each GGRN link the three delay factors are then computed based on the following expressions:

$$TCD = (XR - \frac{TEW}{2}) \left[TC * 1.5\ LC \right]$$

$$TTBD = \frac{TC}{Q} \left[ZC * BL \right] * \left(XR - \frac{TEW}{2} \right)$$

$$TSBD = 2\ TTBD$$

where:

TCD = passenger minutes delay due to truncated cars on cross street

(TTBD)(TSBD) = passenger minutes delay due to truncated thru (stop) buses on cross street.

$XR - \frac{TEW}{2}$ = truncated car delay interval; cross street red less half the extension period

TC = truncated cars per lane as defined earlier

1.5 LC = scaling factor as defined earlier

Q = queue per lane as defined earlier

ZC = bus count in zone as defined earlier

BL = bus passenger loading as defined earlier

Truncated bus counts are seen to be proportioned to truncated car counts with stop buses considered twice as prone to truncation as thru buses. These factors will probably change as real time traffic control experience is gained.

After computations have been completed on all contributing links, a summation is made to obtain the overall intersection gain.

4.9 Source Edit Routine

A Source Edit Routine has been written to facilitate the updating of symbolic files on tape or disk. The routine can be used to insert/delete source statements into Assembly language/FORTRAN programs whose source is stored on 7-track packed binary tape or a RAD file. The routine (see Figure 4.9.1) is incorporated on the Systems Program area of the RAD on file, EDIT.

The F:200 and F:201 Data Control Blocks should be assigned to the input file and output file, respectively. By default, F:200 is assigned to RAD file D1, DATA and F:201 is assigned to tape drive E0. The two Data Control Blocks, F:200 and F:201 cannot be assigned to the same device/file. Sample job deck set-ups are shown on page 4.9.2.

Except for the first card, the update data deck is organized in a manner identical to the Macro-Symbol Assembler update feature, and is as follows:

1. The first card must be an I.D. card that contains a date and change number which is to be printed on the updated listing.

2. Inserting source cards

   + xxxxx, where xxxxx is the source listing line number of the card after which the input cards are to be inserted.

   CARDS TO BE INSERTED

3. Delete and Insert

   + xxxxx, yyyyy, where xxxxx is the first line to be deleted and yyyyy is the last.

   CARDS TO BE INSERTED (OPTIONAL)

4. The update deck should be terminated by a +END Card.

Special care must be taken in updating FORTRAN source files since the compiler resets the source line count each time it encounters a subroutine. The routine requires the actual sequence number of the card (i.e. indicating its actual position in the file). Therefore FORTRAN source numbers must be accumulated under such conditions.

The Source Edit Routine supplies the following outputs and diagnostics:

1. Updated source file on the device assigned to F:201. NOTE: If F:201 is assigned to a RAD file on the protected D4 area, a 'SYC' KEY-IN is required before executing EDIT to allow the routine to write on the file.

2. All inserted lines are indicated in the updated source file (on the device assigned to F:201) by date and change number.

3. List, on line printer, of all cards deleted by each update packet.

4. All lines deleted are indicated in the updated source file (on the device assigned to F:201) by ***LINES DELETED*** with date and change number. this is not done if the lines are being replaced with new lines.

5. Diagnostic for non-sequential updates (UPDATE DECK SEQUENCE ERROR).

6. Diagnostic for first line number exceeding last line number when using delete and insert option. (**UPDATE ERROR** 1ST LINE NUMBER EXCEEDS 2ND).

7. Diagnostic for line number outside file limits. (SPECIFIED LINE NUMBER OUTSIDE FILE LIMITS).

8. Diagnostic for missing I.D. card. (FIRST INPUT CARD IS NOT DATE CARD).

Source Edit Routine examples:

1. Update a symbolic source program stored on 7-track tape and put updated source on another 7-track tape.

Procedure:

a. Mount input tape on E0.

b. Mount output tape on E1, with write ring in.

c. Run the following JOB:

```
!JOB
!STDLB (BO, 7TAE1)
!ASSIGN (F:200, B1)
!ASSIGN (F:201, BO)
!EDIT
      UPDATE CARDS
!FIN
```

2. Update a symbolic source program stored on 7-track tape and put updated source on a RAD file named SOURCE on the D4 area of the RAD.

Procedure:

a. Mount input tape on E0

b. Run the following JOB:

```
!JOB
!ASSIGN (F:200, BI)
!ASSIGN (F:201, D4, SOURCE)
!PAUSE KEY-IN 'SYC'
!EDIT
      UPDATE CARDS
!FIN
```

```
FORTRANH SI,LS,G=,S
   EXTENDED FIV=4. VERSION D00
      1                  DIMENSION  LINE(20)
      2                  DIMENSION  IDATNUM(2)                                  113 14.1
      3                  DATA  IDATE/'DATE'/                                    113 14.1
      4                  DATA  IPL,ISTOP,INEW,IBL/'+   ','+END','+NEW','     '/
      5             1000 READ (105,30,END=15) ID,IDATNUM                        113 14.1
      6                  IF (ID .NE. IDATE) GO TO 23                            113 14.1
      7                  IND = 1
      8              100 READ (105,1,END=6)  IC,ISTRT,IEND
      9                  IF (IC .NE. IPL)   GO TO 22
     10              101 IF (ISTRT .LT. IND)   GO TO 12
     11                  KK = 0                                                 113 14.1
     12                  IF (IEND .NE. 0)   GO TO 8
     13                  DO 3 I = IND,ISTRT
     14                  READ (200,2,END=20)  LINE
     15                  IND = IND + 1
     16                  IF (LINE(20) .EQ. INEW)   LINE(20) = IBL               113 14.1
     17                3 WRITE (201,2)  LINE
     18                5 READ (105,2,END=6)  LINE
     19                  IF (LINE(1) .EQ. ISTOP)   GO TO 6
     20           S      LB,9    LINE
     21           S      CI,9   X'4E'
     22           S      BNE     51S
     23                  IF (KK .EQ. 0) GO TO 500                               113 14.1
     24                  WRITE(201,40) IDATNUM                                  113 14.1
     25              500 CONTINUE                                               113 14.1
     26                  DECODE (80,1,LINE)  IC,ISTRT,IEND
     27                  GO TO 101
     28               51 DO 510 I = 1,2                                         113 14.1
     29              510 LINE(I+18) = IDATNUM(I)                                113 14.1
     30                  KK = 0                                                 113 14.1
     31                  WRITE (201,2)  LINE
     32                  GO TO 5
     33                6 READ (200,2,END=7)  LINE
     34                  IF (LINE(20) .EQ. INEW)   LINE(20) = IBL
     35                  WRITE (201,2)  LINE
     36                  GO TO 6
     37                7 END FILE 201
     38                  STOP
     39                8 K = ISTRT-1
     40                  KK = 1                                                 113 14.1
     41                  IF (ISTRT .GT. IEND)   GO TO 13
     42                  IF (IND .EQ. ISTRT)   GO TO 11
     43                  DO 4 I = IND,K
     44                  READ (200,2,END=20)  LINE
     45                  IND = IND + 1
     46                  IF (LINE(20) .EQ. INEW)   LINE(20) = IBL
     47                4 WRITE (201,2)  LINE
     48               11 CONTINUE
     49                  WRITE (108,17)
     50                  DO 9 I = IND,IEND
     51                  IND = IND + 1
```

FIGURE 4.9.1 SOURCE EDIT ROUTINE

```
52                READ (200,2,END=20)  LINE
53              9 WRITE (108,18)  LINE
54                GO TO 5
55             12 WRITE (108,14)  IC,ISTRT,IEND
56             15 REWIND 201
57                STOP 999
58             13 WRITE (108,16)  IC,ISTRT,IEND
59                GO TO 15
60             20 WRITE (108,21)
61                GO TO 15
62             22 WRITE (108,19)
63                GO TO 15
64             23 WRITE(108,50)                                                    113 14.1
65                GO TO 15                                                         113 14.1
66              1 FORMAT (1A1, 2I)
67              2 FORMAT (20A4)
68             14 FORMAT (// 10X, 'UPDATE DECK SEQUENCE ERROR' / 10X, 1A1,I5,',',I5)
69             16 FORMAT (// 10X, '** UPDATE ERROR **', '  1ST LINE NUMBER EXCEEDS S
70               1ECND', / 10X, 1A1, I5,',', I5)
71             17 FORMAT (50X, '**** LINES DELETED ****' /)
72             18 FORMAT (40X, 20A4)
73             19 FORMAT (10X, 'NO PLUS SIGN ON UPDATE DIRECTIVE')
74             21 FORMAT (10X, 'SPECIFIED LINE NUMBER OUTSIDE FILE LIMITS')
75             30 FORMAT (1A4,1X,2A4)                                              113 14.1
76             40 FORMAT ('**********  L  I  N  E  S     D  E  L  E  T  E  D  **********',26X,2A4) 113 14.1
77             50 FORMAT (10X, 'FIRST INPUT CARD IS NOT DATE CARD')                113 14.1
78                END

SUBPROGRAMS

   &MAIN      F:105      F:106      F:108      9INITIAL   M:D8       M:8C       9BCDRDFE
   9I8DATA    9I8LUSA    9BCDWRIT   9DEC8DE    9ENDFILE   9STOP      9ENDI8L    9REWIND

PROGRAM ALLOCATION

184.0      IDATE      185.0      IPL        186.0      ISTOP      187.0      INEW       188.0      I8L
189.0      ID         18A.0      IND        18B.0      IC         18C.0      ISTRT      18D.0      IEND
18E.0      KK         18F.0      I          190.0      K

191.0      LINE       1A5.0      IDATNUM

PROGRAM SIZE 1A7



PROGRAM END
```

FIGURE 4.9.1 SOURCE EDIT ROUTINE (Continued)

4.10 References

Table 4.10.1 lists reference manuals which may be used in conjunction with the UTCS/BPS Software Manual.

Table 4.10.1. Reference Manuals

Manual Title	Publication Number	Company
UTCS/BPS Traffic System Operator's Manual	GF-15-1003	Sperry System Management Division
UTCS/BPS Traffic System Maintenance Manual	GF-14-1001	Sperry System Management Division
Xerox Sigma 5 Computer Reference Manual	900959F	Xerox Data Systems
XDS Sigma 5/7 Extended FORTRAN IV-H Reference Manual	900966E	Xerox Data Systems
Xerox Extended FORTRAN IV-H Operations Reference Manual	901144D	Xerox Data Systems
Xerox Macro-Symbol Language and Operations Reference Manual.	901578B	Xerox Data Systems
Xerox Real-Time Batch Monitor (RBM). Real-Time and Batch Processing Reference Manual	901581D	Xerox Data Systems
Xerox Real-Time Batch Monitor (RBM). Real-Time and Batch Processing User's Guide	901653A	Xerox Data Systems

Table 4.10.1 Reference Manuals (Continued)

Manual Title	Publication Number	Company
Xerox Real-Time Batch Monitor (RBM). System Technical Manual	901700B	Xerox Data Systems
XDS Sigma 5/7 Real-Time Batch Monitor (RBM-2) Operations Manual	901647A	Xerox Data Systems
XDS 7012/14/21/8091/92 Keyboard/Printer (ASK/KSR) Reference Manual	901672A	Xerox Data Systems
XDS 7120/7122/7140 Card Reader Reference Manual	900970E	Xerox Data Systems
XDS RAD Storage Models 7201/7202/7203/7204 Reference Manual	900978A	Xerox Data Systems
XDS 7611-7616/7622-7623 COC Equipment Reference Manual	900981B	Xerox Data Systems
XDS 7440/7445 Buffered Line Printer Reference Manual	901014D	Xerox Data Systems
XDS 7165 100 CPM Card Punch Reference Manual	901567A	Xerox Data Systems
XDS Sigma System Interface Units	64-28-01C	Xerox Data Systems
XDS Sigma 5 Computer Reference Card	901624C	Xerox Data Systems

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